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JANUARY

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THE REVOLUTION IN AIR CARGO

I'M STILL LEARNING ABOUT FLYING, BY EDGAR BERGEN

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JANUARY, 1960 VOLUME 66, NUMBER 1

THE COVER: The new Bellanca 260 made an attractive subject for the camera of Howard Levy. Read check pilot report, page 36.

CONTENTS

Editorial: For Pondering in 1960 22

Revolution in Air Cargo . . . . . *Eliot Tozer* 24

Business Flying Co-operative . . . . . *Lois C. Philmus* 26

Julius Caesar Flies North . . . . . *Charles F. Blair Jr.* 28

The Airman's World . . . . . *Gill Robb Wilson* 32

Is the Autogiro Making a Comeback? . . . . . *James G. Ray* 34

Check Pilot Report: Bellanca 260 . . . . . *Ted Durosko* 36

Weather Reports by TV . . . . . *Myron B. Gubitz* 38

Grounded at 60? . . . . . *Kendall K. Hoyt* 39

Make Mine Skis . . . . . *George W. Larose* 40

The Sensational Growth of Northrop Institute . . . *Gill Robb Wilson* 42

Sky Harbor Expands Again . . . . . *Franklin D. Walker* 44

I'm Still Learning About Flying—by Flying . . . . . *Edgar Bergen* 46

Check Pilot Report: Aeronca Chief . . . . . *Tom Denny* 48

Sunny South Opens New Quarters . . . . . *Hans Groenhoff* 49

Flying Newsreel 50

I Learned About Flying From That! No. 236 . . . *Joseph M. Golden Jr.* 56

FLYING FEATURES

Mailbox 6

Briefings 10

Have You Read? 20

Hangar Flying 64

Overnight Stop, No. 56 72

Flying Calendar 66

Picture Credits 84

Advertising Index 97

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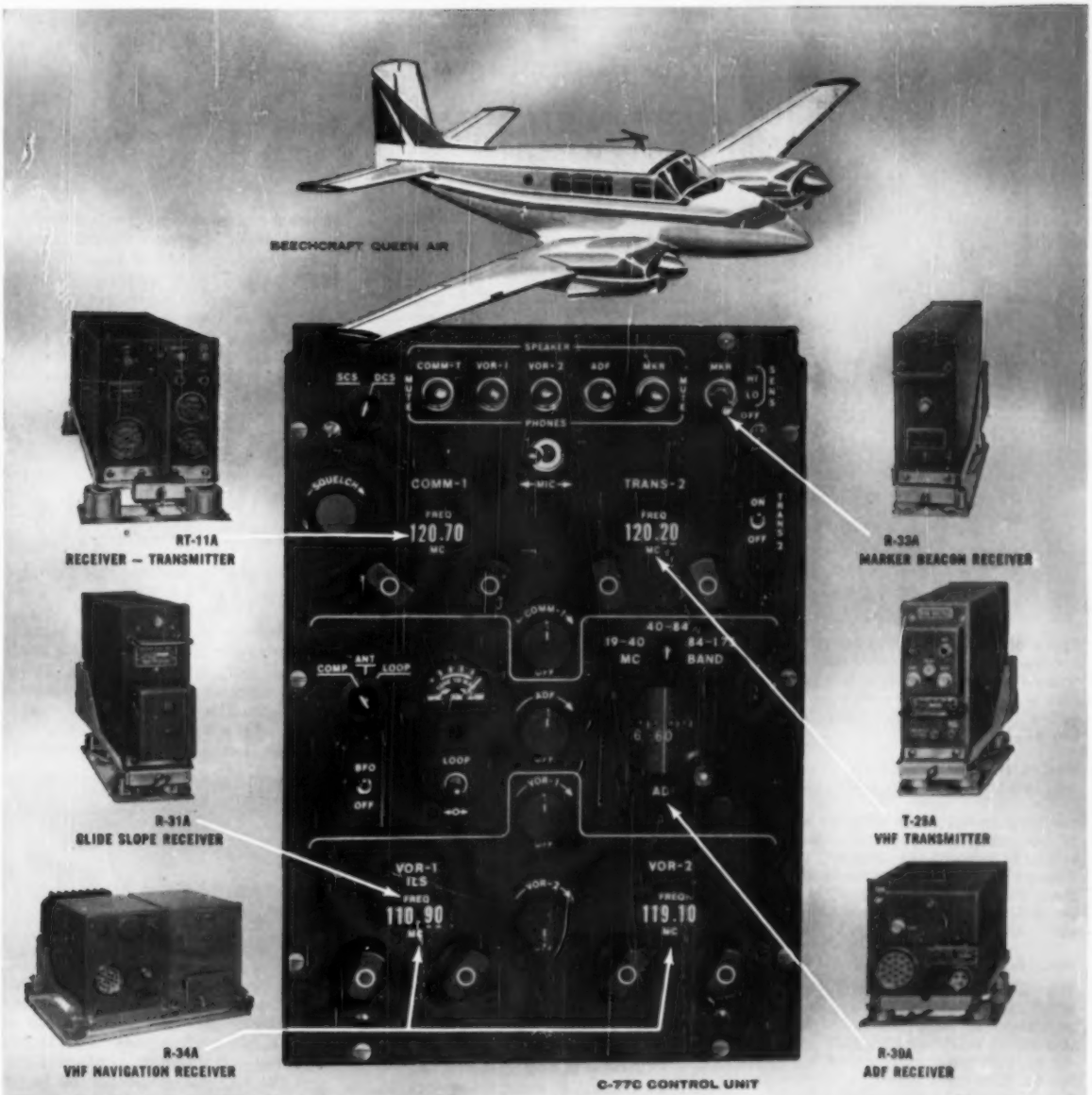

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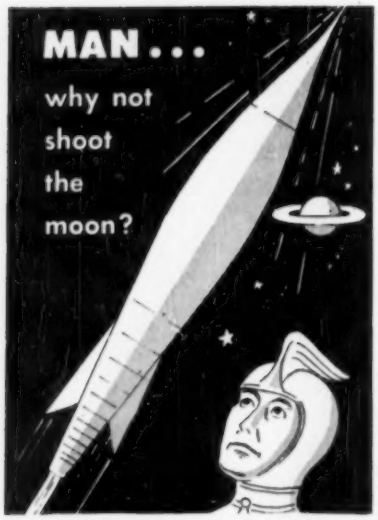

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MAILBOX

ALIEN PILOTS AND RADIO SILENCE

I have read with great interest Dale S. May's letter in your February issue (re: his difficulty abroad as an American pilot in getting permission to fly). I know just how he feels, because I, too, am engaged in the battle with Bureaucracy on this side of the Atlantic.

I have my private pilot's license, and fly a lightplane for pleasure locally, with an occasional longer trip. However, I am not an American citizen, and due to a law passed in 1934, am not as such permitted to use the radio transmitter. Now, in August 1958, Congress passed another law permitting non-citizens to obtain a limited radio-telephone operators permit. In great glee, I immediately made application to the FCC, so that I could avail myself of this not inconsiderable factor of safety in flight. Now 12 months after this law was signed . . . in spite of repeated enquiries, I am informed that the FCC is not yet ready to issue any licenses. So, I continue to fly around looking at the transmitter and not allowed to use it . . . on pain of penalty and possible deportation. . . .

JOHN HUGHES, M.D.

Poquoson, Va.

● FLYING *submitted a copy of Dr. Hughes' letter to FCC with a request for clarification. In reply the Commission advises, in essence, that due mainly to certain implications in the wording of the amended legislation a number of problems remained to be worked out between FCC, FAA and other Federal agencies. These now have been overcome and FCC is in the process of expediting the applications at hand. (For full details see FCC Report 601, dated Oct. 1, 1959, available from the Commission, Washington 25, D. C.)*—ED.

BUSINESS FLYING IN BLACK INK

I like Charles E. Gregg's article in September FLYING entitled "Business Flying in Black Ink." I am sure some of my sales prospects would get a great deal of useful information from that article too . . . and would like to obtain extra copies of the issue if at all possible.

It is a difficult job to get people in this area airminded, especially businesswise. I have many people yet to be convinced that other persons solve the same type of travel problem through flying. . . .

DICK PICKLES, Manager

Ohio Valley Flying Service
Parkersburg, W. Va.

OF MEN AND PLANES

As a long-standing admirer and enthusiast of all the world famous Douglas DC series transports, I was most gratified to read your really excellent article "Of Men and Planes," as told by the great Donald Douglas himself.

For more than 20 years I've never stopped my seemingly endless research studies on the DC series, right from the truly history-making and revolutionary DC-1 through to the giant DC-8 Jetliner of today . . . and in the past 14 years have had at least a dozen full-length articles on all in the series, except the DC-8, in leading British aviation journals. . . . In addition, my collection of DC photographs . . . totals over 400. . . .

Your fine journal has done a fine job in publishing "Of Men and Planes." . . . My heartiest congratulations and thanks for one of the best aviation articles ever published, anywhere in the world.

DENNIS M. POWELL, F.R.G.S.
Nairobi, Kenya, East Africa.

I have just finished reading FLYING for September . . . and the interesting story by Donald Douglas, Sr.

While I can appreciate there is many a slip 'twixt the lip and the way a thing is printed, and, undoubtedly Mr. Douglas knows more about aerodynamics etc., of a propeller than I ever will, I quote part of a paragraph on page 43 wherein Mr. Douglas is reported to have quoted Raymond as saying . . . "A pilot can automatically adjust the blades (of the new controllable pitch propellers) so they will take *bigger bites of air at take-off power* . . . the bite thereafter can be lessened for economical cruising speed. . . ."

Douglas DC-1

If that was the way the props were adjusted at that time, getting the DC-1 off the ground when fully loaded must have really been something to write home about. . . . I simply haven't the nerve to adjust a prop for "bigger bites" at take-off from most of the air strips from which I fly. . . . Pardon me, but I couldn't resist doing this!

J. T. WELLS

Cananea, Sonora, Mexico.

A NAY FOR CAR 59-11 PROPOSAL?

I am enclosing a copy of a letter which I have addressed to Wm. B. Davis, Director, FAA Bureau of Flight Standards in the hope that through publication in your columns other A & P's will stand up and be counted.

"Dear Sir:

"Under the proposed ruling of CAR Draft Release No. 59-11, the services of

(Continued on page 8)

Who told <u>you</u> that skiing is great adventure?
<u>You found out for yourself!</u>

Find out for yourself what it's like to fly the big LAKE 4-Place AMPHIBIAN

Isn't it true? In all your big experiences with life, what someone *says* can never take the place of what you know yourself. Even the opinion of those you trust is no substitute for your own experience. And this is true in aviation.

Our second-best advice to you is this: "Get the opinion of a man who *actually has flown* the Lake Skimmer. See what he has to say about this agile amphibian."

Our *best advice* to you is to take the controls of a Skimmer and find out for yourself what America's one-and-only single-engined amphibian *can do for you*, and your business, too.

Land or water, the Skimmer touches either with a sweet, smooth, safe landing . . . flashes to a take-off from either, in seconds. To be equally at home on land or in the water — that's what *amphibian* means.

Look to Lake for the latest — in aircraft like this. Built to take its place as the work-horse of the business-flying field, this big four-place amphibian couples "multi-engine" feel and stability with handling-ease and maneuverability land planes can envy. *You'll be amazed.*

But watch out — there'll be a burning yearning in your chest until you pilot a Skimmer for your company, or own one for yourself.

Lambros

"Truly amazing performance"

says George Lambros, Jr., President, Lambros Seaplane Base, Ridgefield Park, N. J., and veteran pilot

"In my judgment, the Skimmer is an excellent amphibian combining the virtues of good aerodynamic and hydrodynamic design," Lambros reports. "As a veteran seaplane pilot, I feel it is an important contribution to general aviation in this country."

During exhaustive test-flights, "I developed an affection for the Skimmer and its gentlemanly ways," he says.

"Phenomenal" handling ease and big-plane stability, maneuverability and high rate of climb were factors influencing his favorable opinion of the Skimmer's truly amazing performance.

For Lambros' complete report, and Skimmer specifications, write or phone. We're busy — but not too busy to talk with *you*.

You know aircraft!

Know these Seven Points of Perfection about the Lake Amphibian:

1. **Agility:** A 78 MPH differential between stalling and cruising speeds means greater safety, good climb out, easy approach, short take-off.
2. **Water Handling:** Hull is designed for easy water handling. Rudder control is outstanding. Downwind turns and taxiing are easy. Cross wind control during landing, taxiing and take-off is excellent.
3. **Speed and Range:** Cruising speed up to 131 MPH. Long range compares favorably with land planes of equal horsepower.
4. **Stability:** Unbelievably stable even in rough air. Feels and handles like a much larger plane, yet very maneuverable. Gentle stall.
5. **Visibility:** Unsurpassed because pilot rides ahead of wing and engine.
6. **Comfort:** Big, wide cabin compares with largest single-engined land planes. Provides generous leg and shoulder room for four people.
7. **Construction:** Rugged all-metal construction, five water-tight compartments, dependable Lycoming 180 H.P. engine, extra-wide-tread tricycle landing gear contribute to high safety factor.

No other plane . . . looks . . . flies . . . like the Skimmer

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MAILBOX

(Continued from page 6)

thousands of A & P mechanics (A & E's prior to 1952) will be seriously curtailed, in that all release privileges in regard to minor alterations will be eliminated.

"A large portion of the credit for advancement in aviation and in the component parts of aircraft belongs to the A & P's who were curious enough to find out why seals leaked (designed by top engineers); why cylinders got too hot (again systems designed by top engineers); why wheel bearings 'froze' in normal service. The A & P in effect is a sort of field engineer for every manufacturer today, suggesting changes, asking the big questions 'why', 'what happened,' and 'what is the best fix and/or cure.'

"The free-lance A & P is subservient to no manufacturer and generally cannot afford any mistake, no matter how small. Do not sell him short. Do not put extra 'paper work' obstacles in his path.

"I urge every pilot, every mechanic, every engineer . . . to get a copy of this draft release, read it, weigh the wording carefully and write his conclusions as requested in the form letter attached to it."

C. C. NELSON, JR.

Seattle, Wash.

IMPORTANCE OF OXYGEN

In your October issue you have an article "When You're High, Use Oxygen" . . . We certainly enjoyed it, and would like to have 50 copies of the article sent to us. . . .

NORMAN RALSTON, President
Aero Air, Inc.,
Hillsboro Municipal Airport, Ore.

FUEL LEANING TECHNIQUES

. . . I particularly liked Ted Durosko's article (Pro's Nest, "Fuel Economy") in the October FLYING. Incidentally, he is theoretically and practically correct in his leaning technique. A refined and more complicated technique such as this is used by all the air carriers in this country using reciprocating engines.

DICK MANKUS
UAL Pilot-Flight Engineer
Stonybrook, L. I., N. Y.

OWNER-PILOT MAINTENANCE RATING?

In answer to Vernon David's letter in "Mailbox," October FLYING, suggesting an Owner-Pilot Maintenance rating, I say Yes.

I have been a pilot and plane owner for 25 years and do not see the need for all of the Federal maintenance regulations. They take up a lot of time at relicense time and cost a lot of money . . . making it more costly to own and fly a plane.

I have always checked and double-checked my plane. Even after re-licensing I go all over it and find it pays, for a number of times I have found loose screws, lost screws, loose fittings, wheel bearings too tight, inspection plates loose and even the upholstery damaged. . . . I could go on; like paying for 18 hours work that could be done in ten; paying $50 where $25 would be plenty. I do not think I would be flying today if I were not personally so fussy about the condition of my plane. . . .

FRED CARPENTER

Auburn, Mass.

A REQUEST

As a reader of your fine magazine, I wonder if you could help me in locating an old acquaintance, Maj. Harold Emerson Anderson? . . . He was a flight instructor in a number of schools, but the last I heard from him he was in Los Alamos, Calif. . . .

NAME WITHHELD

Sandusky, Ohio.

● *Should Major Anderson read this and communicate with our Editorial offices, One Park Ave., New York 16, we shall be pleased to forward the correspondent's name to him.*—ED.

CREDIT REMMERT-WERNER

In your November issue on Page 50 "Flying Newsreel" you show a picture of Edgar Queeny's Super Catalina and state that modification was done by a Canadian company (Timmins of Montreal). This conversion was designed, engineered and converted entirely, including airframe, interior, and R2600 engine installation, by Remmert-Werner, Inc. of St. Louis. The Canadian company mentioned had no connection of any kind with the airplane or work or the engineering.

C. S. WEAKS

Remmert-Werner, Inc.
Lambert Field, St. Louis.

● *We sincerely regret we were given the wrong source.*—ED.

STATE AIRPORT DIRECTORIES

May I also add to Sharon Monahan and U. Owen Walker's list of states that offer free airport directories. Connecticut offers a directory in aerial photograph form and all facilities listed. Copies may be obtained from Dept. of Aeronautics, Brainard Field, Hartford.

JAMES J. SANDILLO

New Haven, Conn.

COVERS MEET WITH APPROVAL

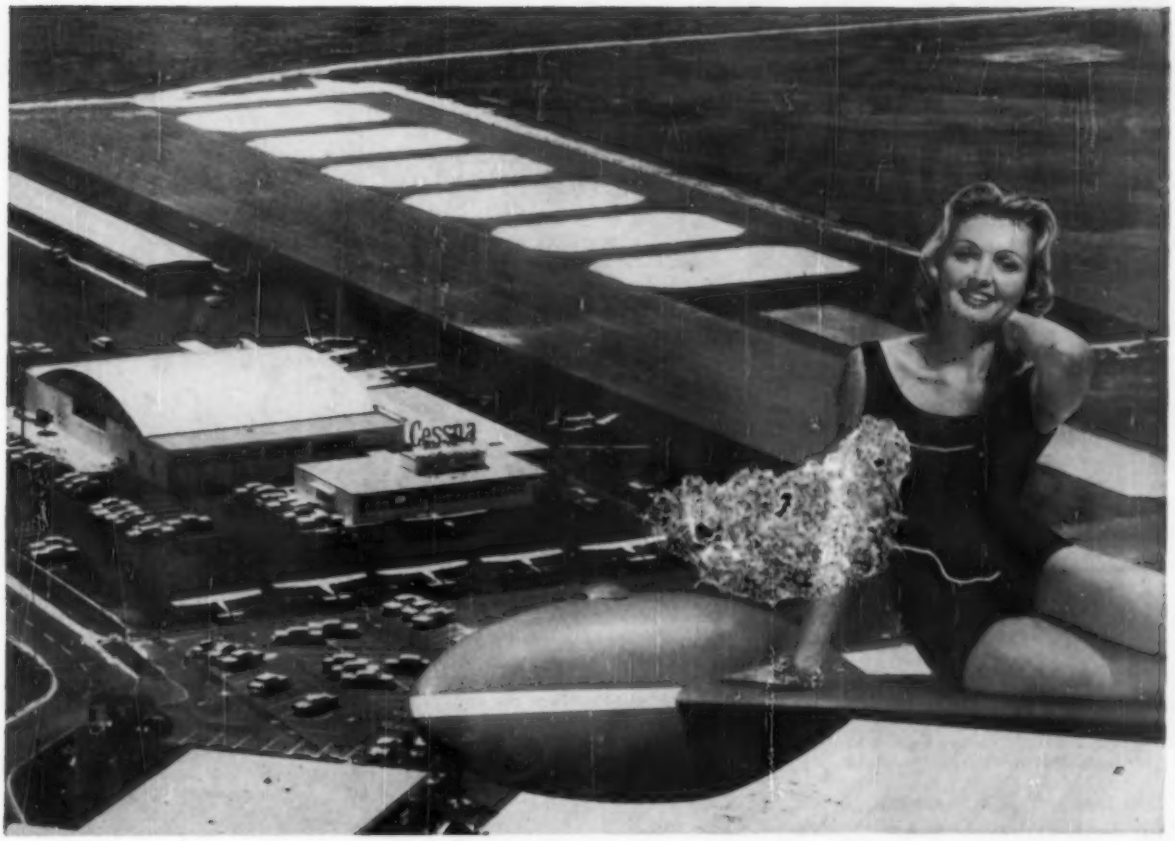
EVERYONE WONDERFULLY PLEASED WITH DECEMBER COVER. . . .

WILLIAM G. ROBINSON
Public Relations Mgr.
Cessna Aircraft
Wichita, Kan.

. . . I particularly enjoyed the 880 cover and the article on TWA and Convair in your November issue.

EARL DALLAM JOHNSON, President

General Dynamics Corp.,
New York, N. Y.



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"When you do, head for Sunny South, at Fort Lauderdale, Fla.! Brand, spanking new from air-conditioned pilots' lounge to parts department, with tie-down and hangar facilities for more than 150 single and multi-engine aircraft, and complete service for plane and radio. See you soon!"

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Briefings . . .

ADDING TO an already impressive list of long-distance over ocean flights, San Francisco's "Flying Watchmaker" Peter Gluckmann, flying a Meyers 200, single Continental-powered, airplane in his latest venture has circumnavigated the globe—an estimated 28,000 miles—in 198 flying hours. Under official supervision of

the FAI, his route carried him to Mexico, San Juan, P.R., Guatemala, Jamaica, the Azores, Lisbon, Bengazi, Cairo, Karachi, New Delhi, Calcutta, Bangkok, Manila, Hongkong, Tokyo, Wake Island, Honolulu and back to San Francisco. San Juan, Lisbon, Cairo, New Delhi, Manila, Tokyo and Honolulu were must stops for FAI observation purposes. Gluckmann's time away from home was 29 days.

KNOWN AS "the missile with the man in it," the record-breaking Lockheed F-104 Jet Fighter has earned this year's Collier Trophy for three engineers and two USAF pilots who were responsible for its development and record-setting flights. Clarence L. Johnson, Lockheed engineer, for design of the air frame; Neil Burgess and Gerhard Neumann of General Electric's Flight Propulsion Div. for development of its J-79 turbojet engine; Lt. Col. Howard C. Johnson, USAF, who in an F-104 set a world land-plane altitude record of 91,243 ft.; and to Maj. Walter W. Irwin for establishing a world straight-away speed record of 1,404.09 mph. The Collier Trophy is awarded annually by the National Aeronautics Assoc. for the greatest achievement in aviation in America during the preceding year.

FORMATION OF a no-down payment aircraft leasing plan has been announced by National City Lines, Inc., Chicago management company, to be operated through its wholly-owned subsidiary, National City Truck Rental Co., Prudential Plaza, Chicago 1, Ill. According to company president, E. C. Houghton, the new service incorporates low interest rates, high residual values and long-term depreciation schedules. A licensing agreement with aircraft dealers is also contemplated.

DESIGNED SPECIFICALLY to provide airline communications power for the executive and light aircraft, King Radio Corp., Merriam, Kan. is producing a new 10-watt Transmitter-Receiver, the King KY-90. Available with either 14-volt ($795.) or 28-volt ($895.) power supply, this 90-

channel, eight-pound unit features an "amazing reach," according to the company and is installed simply by removing the face-plate. In the USA and Canada, through King dealers; elsewhere through Cessna distributors.

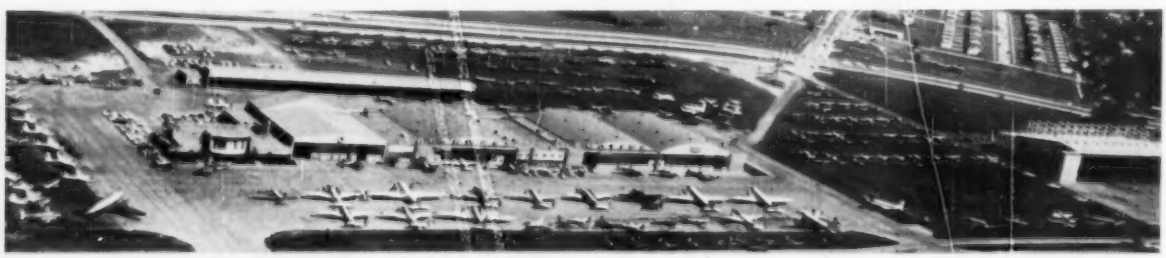
FULL MANUFACTURING RIGHTS and existing inventories of Colonial Aircraft Corp., manufacturers of the single-engine "Skimmer" amphibian have been purchased by Lake Aircraft Corp., a recently formed Delaware corporation headed by former Grumman test pilot, John F. Strayer. Production will continue in Sanford,

Maine, where the airplane was first introduced in 1955, with the first Skimmers under the Lake label scheduled for completion early this Spring. With a pair of Skimmers for back-ground, Jack Strayer (left) is pictured discussing final sales agreement with David Thurston, president of Colonial.

WISCONSIN'S State Aeronautics Commission is receiving well deserved praise for a recent survey, believed to be the first of its kind on a statewide basis, to determine the benefits accruing to a state through an adequate system of airports. Completed with the cooperation of the state's airport owners, the survey's highly affirmative findings are released in a detailed report entitled "Airport Benefits," a limited number of which are available gratis from the Commission, at Madison 2, Wis.

PRICES ARE UP. Both Cessna and Beech Aircraft have listed price advances for their 1960 line of aircraft. Cessna's new high-wing, retractable gear Model 210 has a price tag of $22,450, with standard equipment. The Skylark, luxury version of the Cessna 175, will be $13,500 compared with 1959 price of $11,600 for the 175. The 172 is now $9,450; the 150, up $225 to $7,250.

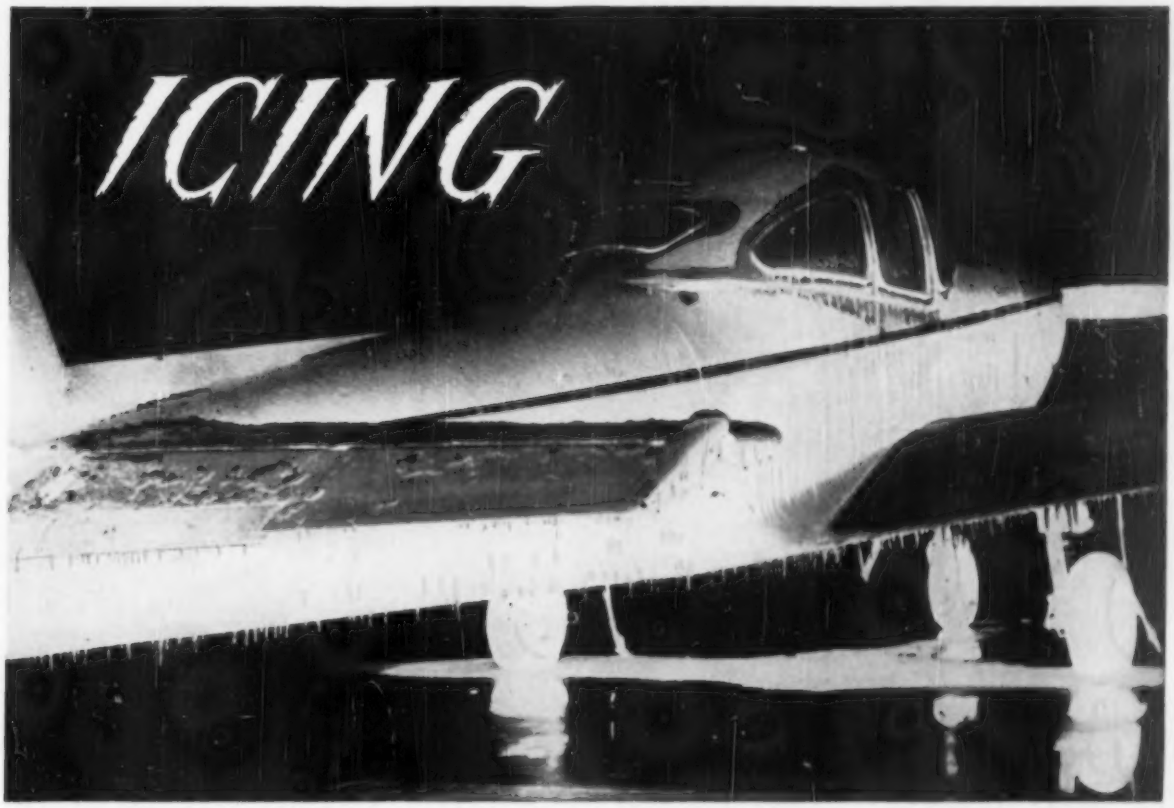
(Continued on page 15)



TAKEN MID MORNING of October 10, the day of the big Texas-Oklahoma football game, this was the scene at Southwest Airmotive's spread at Dallas' Love Field. More than 200 planes were tied down at this point; by kickoff time 320 had parked. In what was probably the largest assignment ever handled by a fixed base operator, SAC personnel also serviced another 100 planes on "routine" visits, over a two-day period, rented 80 automobiles and rallied countless taxicabs; pumped 31,000 gallons of gas and in all played host to some 1,500 persons. In one 90-minute period after the game 75 aircraft had taken off, most of them, according to Southwest Airmotive, carrying uphappy Oklahoma fans.

FLY WEATHER-WISE

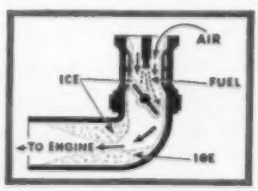
These weather items prepared in consultation with the United States Weather Bureau



Some observations on a major weather problem in aviation

Layer-type clouds—Icing conditions may extend over broad areas in this cloud formation causing continuous ice build-up within the cloud layer.

Cumuliform and cumulus clouds—As contrasted to layer-type clouds, icing in cumuliform clouds may be found at considerably higher altitudes. In the tops of cumulus clouds, even with temperatures above freezing, clear ice may be formed at a dangerously rapid rate. This is especially true in such clouds formed over or near large bodies of water.



Temperature—Heaviest icing usually occurs in 15°F. to 32°F. range. Therefore, watch should be kept for ice formation on aircraft when flying in clouds or precipitation if outside air temperature is in or near this range. Remember, even in clear weather carburetor icing may occur when temperatures are between 20°F. and 70°F. and humidity is high. Temperature of air passing through carburetor may drop as much as 60°F., causing frost to form and restricting flow of fuel to engine.

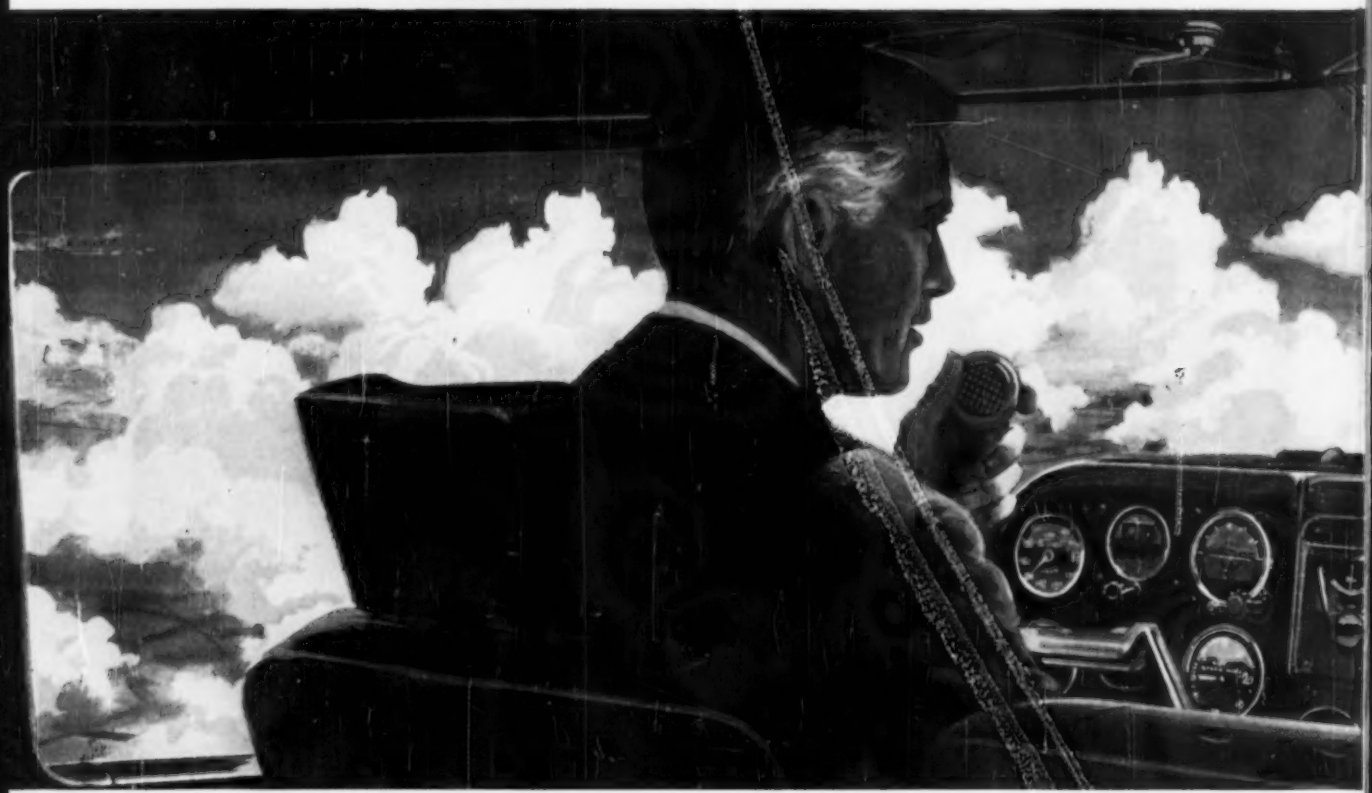
FORECAST: *Top Flight Performance with Mobilgas Aircraft and Mobiloil Aero!*

Plan your flight with Mobil. Use Mobilgas Aircraft and Mobiloil Aero—for top performance at all temperatures and in all weather conditions.

Mobil

You're Miles Ahead With Mobil

SOON YOU CAN FLY WITH



Ready in 1960, new automatic pilot for single aircraft employs "building block" concept...

Early in 1960 a new Sperry development—the SP-3 family of Automatic Pilots—will extend the benefits of automatic flight control to a whole new classification of commercial and private aircraft. Providing much-needed help for the busy pilot, this fully-transistorized automatic pilot increases the safety of every flight . . . offers airline precision and reliability when on instruments . . . increases economy of ownership by keeping your plane in the air more of the time. Unique modular "building block" design lets you begin with any desired degree of control—three, two or a single axis—selecting from a total of five configurations, to provide utmost flexibility to suit the application. For example:

THREE-AXIS SYSTEM: *Pilot sets course—SP-3 flies it smoothly*

"A full 3-axis system adds just 18 pounds."

With the 3-axis SP-3, your aircraft is under full automatic control. The pilot simply sets his course. The SP-3 takes over to fly the plane . . . keep it level . . . steer it straighter than a human pilot can . . . and hold the desired heading unerringly. Automatic rudder, aileron and elevator action controls yaw, roll and pitch through time-tested Sperry air-driven Gyro-Horizon and Directional Gyro.

TWO-AXIS SYSTEM: *Straight, level and on course*

"We could begin with roll and pitch control, and add the third axis later."

The two-axis SP-2 in its simplest form uses the Sperry Gyro-Horizon to provide stabilization in pitch and roll. The SP-2A provides the additional feature of heading hold by using the Sperry Directional Gyro to make heading corrections through the roll axis.

SPERRY

and light twin-engine adds just 18 pounds

SINGLE-AXIS SYSTEM: *Keeps the aircraft flying straight and on heading*

"Even with one axis, we'd be lots better off in weather, and could have heading hold."

The basic single-axis SP-1 uses the rudder to keep the aircraft on course at all times, and is almost an indispensable minimum in flying today. It prevents "graveyard spirals" for the pilot who inadvertently enters below-minimum weather conditions. It provides yaw stabilization, through the rudder, using the Sperry Directional Gyro. A second configuration, the SP-1A, offers roll stabilization by means of the Gyro-Horizon, through aileron control, and includes the Sperry Directional Gyro for heading hold.

ADD AXES AS DESIRED — With its advanced all transistor design in the modular or "building block" concept, the system is easily installed, and additional axes can be added quickly, easily, and at low cost, with no sacrifice of initial investment.

FLIGHT CONTROLLER

COMPUTER-ACTUATOR

PRECISION AND DEPENDABILITY—Sperry's long experience assures the dependability of the SP-3 family of Automatic Control Systems; but in the event that service is required, one "building block" can be removed and a spare installed immediately, so that your aircraft is kept flying while repairs are made to the original unit.

With the new Sperry SP system you take advantage of Sperry's nearly half-century of experience in automatic flight, beginning with the first "automatic pilot" demonstrated by Lawrence Sperry in 1912, and including the world's leading military and commercial planes . . . among them the Douglas DC-8, Convair 880 and 600 jetliners, which have the jet-age SP-30 Sperry Flight Control System.

Write for descriptive booklet, stating the name and model of the aircraft you own or plan to buy.

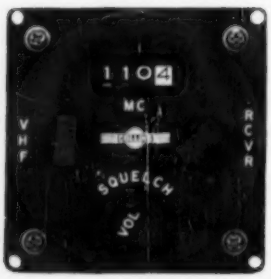
SPERRY

SPERRY PHOENIX COMPANY, *DIVISION OF SPERRY RAND CORPORATION, PHOENIX, ARIZONA*

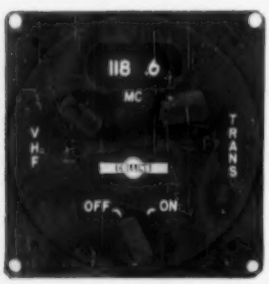
COLLINS COMM/NAV

DESIGNED FOR PANEL MOUNTING
BUILT FOR RELIABILITY
PRICED FOR YOUR AIRPLANE

FAA TSO'D . . . FCC TYPE ACCEPTED



Every pilot can afford the performance, dependability and safety of Collins communication-navigation systems. All Collins units are TSO'd and type accepted for IFR needs. They use the same components as the highest quality airline equipment, and undergo the same reliability and environmental testing. Less than $9\frac{1}{2}$" long with connectors, all panel mount in any aircraft.



51X-3 VHF Receiver— 190 crystal-controlled channels from 108.0-126.9 mc. Squelch and audio controls on front panel. Provides VOR and localizer service when used with the Collins 344D-1, and additional crystal-controlled NAV services with Collins 344A-1, B-1A VOR Instrumentation Units. Provides automatic glideslope frequency selection when localizer frequencies are selected. Front panel edge lighting. Weighs 3.25 lbs. Price $620.00.

17L-8A VHF Transmitter— 90 crystal-controlled channels from 118.0-126.9 mc. 3 watts output. Front panel edge lighting. Weighs 2.5 lbs. Price $340.00.

344D-1 VOR Instrumentation Unit— Left-right VOR and localizer indicator. Provides To-From indications and course selection while it displays reciprocal bearing. Completely transistorized and available in 13.75 and 27.5 volt systems. Weighs 2.4 lbs. Price $975.00.

618F-1 VHF Transceiver— 360 crystal-controlled channels from 118.00-135.95 mc with 50 kc spacing. Provides air-to-ground communication with direct frequency presentation and SCS or DCS operation. 6 watts minimum output. Weighs 5.4 lbs. (12.7 with power supply). Price complete $2295.00.

Communication Systems with power supply $1520 or $2295

Communication-Navigation System with power supply $2495

See your Authorized Collins Distributor for complete information and technical specifications. Write Collins Radio Company, Cedar Rapids, Iowa, for descriptive literature.

COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA

Briefings . . .

(Continued from page 10)

Beech announces the Super G18 at $126,000; Model 65 Queen Air, $120,000; the H50 Twin-Bonanza, $95,500 and Model D50C Twin-Bonanza at $83,000. Model B95 Travel Air, $51,500; M35 Bonanza $25,300; and Model 33 Debonair, $19,995. All prices FAF, Wichita, Kan.

FOR FABRIC-COVERED airplane touch-up and patching, Cooper Industries, 2149 E. Pratt Blvd., Elk Grove Village, Ill. is offering a time and money-saver in its Super-Flite "Patch Kit". Consisting of three 16-oz spray cans (one each of Softener, clear Butyrate Dope and Aluminum Butyrate Dope), the kit also includes a half-dozen each of two, three, five and seven-inch circular patches cut from Grade A material. Kit complete $9.95.

A FLASHLIGHT BATTERY which fully recharges itself overnight when its cartridge is plugged into an ordinary 110-volt household outlet is in production at Sonotone Corp. (hearing aids and electronic equipment) Elmsford, N. Y. Capable of "outlasting the products in which

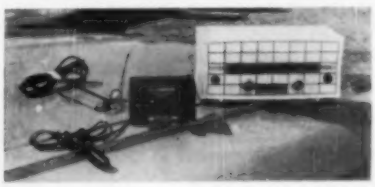
used," the cartridge contains a charger and two Sonotone sealed, sintered-plate, nickel-cadmium cells; slips into any standard flashlight now using two "D"-size standard batteries. Factory suggested price, for commercial market $7.95.

AGAIN SCORING a proud record in search and rescue flights and emergency missions within the United States, the Civil Air Patrol during the first six months of 1959 lead with 3,745 such flights for a total of 7,372 hours in the air. The record, as reported by the Continental Air Command under which CAP operate as a civilian auxiliary of the USAF, indicates over half of all search and rescue missions in the nation were carried out by CAP during that period.

TWO ANNUAL FAA publications reporting the latest figures on active civil aircraft in the U. S., are again on sale at the Government Printing Office, Washington 25, D. C. Entitled "U. S. Active Civil Aircraft by State and County" (55 cents) and "Statistical Study of U. S. Civil Aircraft" (35 cents), these inexpensive booklets present a most complete picture of our busiest segment of aviation, up to Jan. 1, 1959 and the figures as reported indicate an overall increase of four per cent in registered aircraft; and a telling eight per cent decrease in airports.

SELECTION of the Lockheed Model 329 JetStar for bombardier-navigators training has been announced by the Air Force. This 600-mph jet utility aircraft won out over the McDonnell Model 119A in competition to meet established AF requirements. As a military trainer, the JetStar interior facilities will provide for two students and an instructor, with full bombardier-navigator instrument training equipment. This aircraft is powered with four P & W JT-12 jet engines.

AS AN OPTIONAL ACCESSORY to its Air-O-Ear VHF Receiver Nova-Tech has developed the Nova/Pack D. C. Converter which will operate from the cigarette lighter of any automobile and bring in air traffic communications at the airport with



complete clarity. Priced at $47.50, the Nova/Pack includes a DC converter (converts 6 or 12 volt power to house current), on-off switch, pilot light, cigarette lighter plug, VHF whip antenna and ten feet of co-ax cable. According to Nova Tech, this converter can also be used to operate other electrical appliances.

TWO YEARS in the process of organization the Fraternal Order of Air Mail Pilots recently became a reality when the first Lodge, known as the Miami Lodge, was awarded its charter from Dade County (Fla.) Judge Herren, long a champion of aviation. Organized for social and educational activities, the idea for such a fra-

ternity, the first of its kind, is credited to Capt. E. C. Edelmann (left) of Eastern Airlines, chairman of the Miami Lodge. In picture with him at charter presentation (above) are Anthony Barone, Assoc. Member, Judge Herren, Capt. Robert Kline (Treas.) and Jos. S. Maddlone, director. All Miami Lodge.

AIRTEX PRODUCTS, Morrisville, Pa., producers of a new line of complete interiors for "do-it-yourself" installation for lightplanes, advises it now has a new line of featherweight replacement cushion sets which are one half the weight of original cushions.

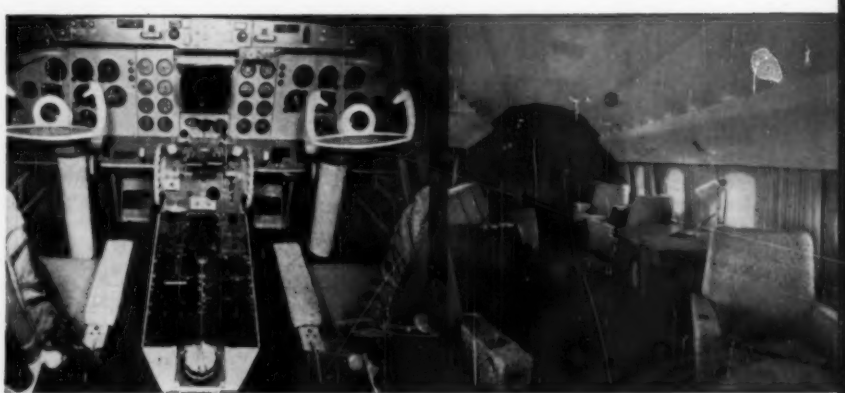
NATIONAL DISTRIBUTION of the Safeather automatic warning system for multi-engine aircraft is now in the hands of Air Associates, headquartered at Teterboro Airport, N. J. A product of Aviation Instruments Mfg. Corp., Houston, Tex., the four-pound safety instrument tells the pilot, in the event of engine failure, which

(Continued on page 98)

LOS ANGELES AIRWAYS which already operates five Sikorsky S-55s and two S-51 helicopters in greater Los Angeles, has ordered five of Sikorsky's S-61 twin turbine-powered helicopters for delivery in 1960 and 1961. Total purchase price is quoted at about $3,250,000. The new helicopters, still to take to the air, are instrumented for all-weather operation and powered by two General Electric T-58 gas turbine engines. In airline configuration shown in mockup (above) the S-61 carries 28 passengers and 1,200 lbs. of mail and express cargo.

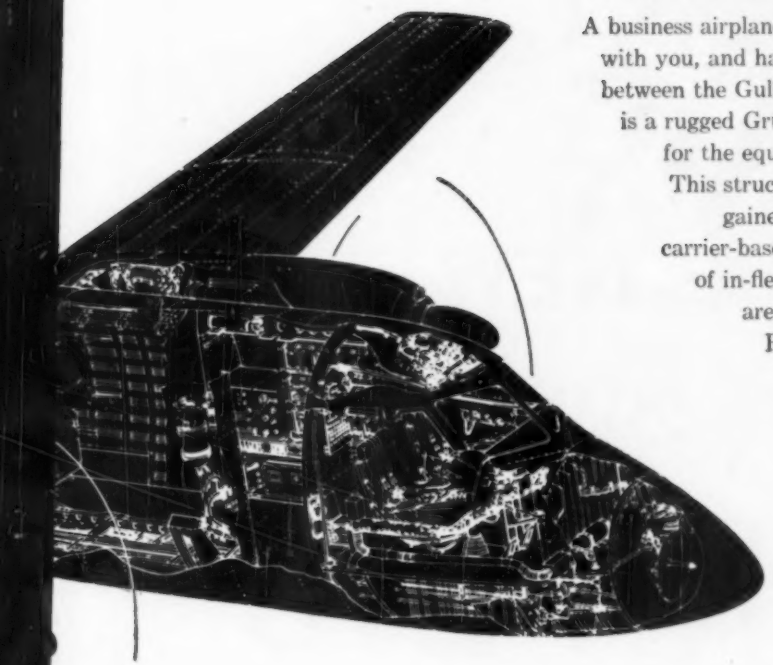
YOU ARE INVITED to inspect the Gulfstream and arrange for demonstration flights through one of the following distributors: Atlantic Aviation, Wilmington, Delaware; Southwest Airmotive, Dallas, Texas; Pacific Airmotive, Burburbank, California; Timmins Aviation, Montreal.

Instrumentation, including the most up-to-date and sophisticated communication, navigation and radio equipment, is custom built into the Gulfstream by these distributors. Custom cabin interiors are fitted to customer specifications. Illustration shows how one Gulfstream owner decorated the aircraft's interior.



Beauty...is more than skin deep

The beauty of any business airplane must be weighed against its past. If it is a "re-do" of an older airplane, the structural stress and strain of years of operation may be invisible today, critical tomorrow. The business airplane must be qualified to meet the stringent licensing requirements demanded by today's—and tomorrow's—all-weather and high density traffic conditions.



A business airplane, like the Grumman Gulfstream, *starts new* with you, and has beauty more than skin deep. Sandwiched between the Gulfstream's clean exterior and custom interior is a rugged Grumman structure built to withstand fatigue for the equivalent of more than 50 years of operation. This structure is based on the most recent knowledge gained from designing supersonic, and especially carrier-based aircraft, required to withstand the rigors of in-fleet service. Within the Gulfstream's nacelles are two Dart turbo-prop engines, their famous Rolls-Royce reliability proven by millions of airline flight hours.

When you select the Gulfstream you get an airplane, new from nose to tail, conceived and engineered by Grumman for today's business flying operations, in terms of performance, utility, reliability, and all-weather safety.

GRUMMAN

AIRCRAFT ENGINEERING CORPORATION

Bethpage • Long Island • New York

THE FIRST IN A SERIES
FOR YOUR
AIRCRAFT COMPARISON FILES...TEAR OUT →

THE COMPLETE STORY OF THE NEW FLIGHT\SWEEP CESSNA 210

the next best thing to taking a demonstration flight!

HANDSOMELY HANDCRAFTED FOR
TO-SPARE COMFORT AND CONVEN

Cessna and only Cessna offers the first and only single-engine commercial airplane with high-stability wing and retractable landing gear

Stretch-out spaciousness / s

A quiet look of good taste enriched by the finest leathers, fabrics, carpetings, and trim materials — appropriately fashion-fits the all-new 210 for top-level executive travel and transport.

Featuring two classically beautiful interior color choices . . . cay coral and aquamarine interwoven with gold mylar, the 210 also offers spacious "polycloud" seating of immediate softness and underlying firmness. Thick, luxurious cabin floor carpeting applied over one-half inch thick, soft polyester pad and "sound-soaking" mat provides vibrationless conference-room quietness. Molded Royalite luggage compartment in matching interior colors provides large, functional storage space. Convenience is added to comfort with extra long front and rear seat arm rests . . . optional, automatically adjustable head rests . . . ash trays, cigarette lighters . . . front and rear "envelope" map pockets . . . rear utility "hammock" shelf . . . contoured sun visors . . and an exciting array of other interior appointments . . . marking the newest of the Great New Cessna Nine as the plane for men going places!

FOR ROOM-
NVENIENCE

all new 210, top of mark in single engine formance, power, pres

CAY CORAL

AQUAMARINE

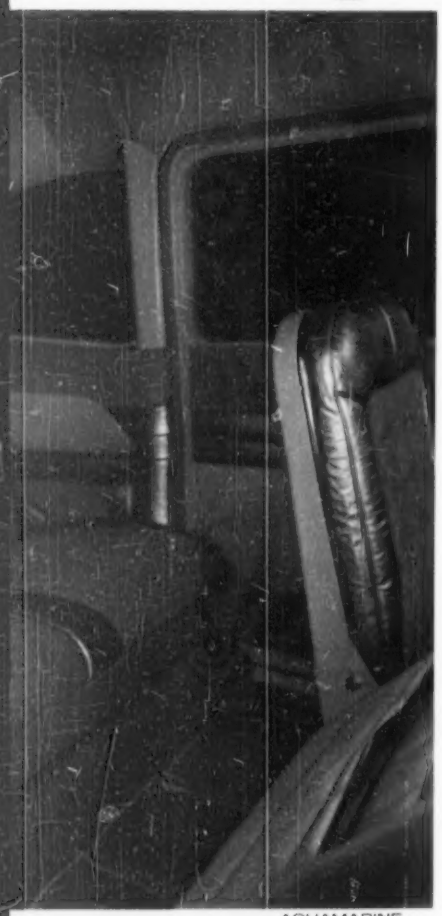
Cabin design provides extra leg room for maximum **stretch-out freedom** . . . also allows plenty of elbow and shoulder room plus excellent forward and side visibility! Low cabin floor permits easy "walk-in" entrance to both front and rear seats with head clearance to spare!

Outside access to baggage compartment is through an oversized door. Activation of latch automatically swings door open to a full up position against the fuselage. Baggage floor height and door position provides maximum loading ease for 120-pound luggage payload . . . Baggage door is big enough to load stretcher patients when used as ambulance ship.

The deep sculptured comfort of "posture padded" seating is complemented by easy in-flight, three-position adjustment of rear seats — provides opportunity for restful, semi-reclining positions during long flights.

ness / sealed-in quietness / for the most relaxing ride in the sky.

new 210, top of the k in single engine performance, power, prestige



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PERFORMANCE AND SPECIFICATIONS

GROSS WEIGHT	2900 lbs.
SPEED: BEST POWER MIXTURE	
Maximum at Sea Level	199 mph
Maximum Recommended Cruise, 75% Power at 7000 feet	190 mph
70% Power at 8000 feet	187 mph
RANGE: NORMAL LEAN MIXTURE	
Maximum Recommended Cruise, 75% Power at 7000 feet	755 miles
55 Gallons, No Reserve	4.0 hours
	188 mph
70% Power at 8000 feet	780 miles
	4.2 hours
	186 mph
Maximum Range at 10,000 feet	1100 miles
55 Gallons, No Reserve	8.0 hours
	137 mph
RATE OF CLIMB AT SEA LEVEL	1300 fpm
SERVICE CEILING	20,700 ft.
TAKE-OFF:	
Ground Run	740 ft.
Total Distance Over 50-foot Obstacle	1135 ft.
LANDING:	
Landing Roll	520 ft.
Total Distance Over 50-foot Obstacle	1190 ft.
EMPTY WEIGHT	1735 lbs.
BAGGAGE	120 lbs.
WING LOADING: Pounds per square foot	16.5 lbs.
POWER LOADING: Pounds/HP	11.2 lbs.
FUEL CAPACITY: Total	65 gals.
OIL CAPACITY: Total	12 qts.

POWER: Continental 6-cylinder, Fuel Injection IO-470-E Engine, 260 rated HP at 2625 RPM

PROPELLER: Constant Speed. Choice of: McCauley or Hartzell 2A36C33/90M-8 — HC-A2XF-1/8433-2

WING SPAN — 36 feet, 6 inches
WING AREA — 175.5 square feet
LENGTH — 27 feet, 4 inches
HEIGHT — 8.15 feet

Specifications subject to change without notice

NO MATTER WHAT YOUR LINE... You can "profit IMPROVE" your business future with the all-new 210! Today, thousands of men on their way up in business own and fly their own Cessna's. Now the all-new 210 adds new striking power in single-engine range . . . power . . . and payload . . . new flying ease . . . new comfort and convenience . . . new flight/sweep styling — a new way to profit IMPROVE business futures!

Designed by Cessna because it was asked for, the 210 provides all the things needed to meet the rigorous tests of full range market exploration and expansion. The 210 offers new highs in single-engine performance *but retains the excellent ground-handling characteristics and ease of control "in-flight" characteristic of lower performance airplanes!* Equipped with the complete advantages of high-stability wing safety, retractable landing gear, luxury plane styling . . . the 210 provides modern business with a great new key to travel-mobility and to progress . . . so compare and

STANDARD EQUIPMENT

INSTRUMENTATION
Airspeed Indicator
Clock
Cylinder Head Temperature Gauge
Flap Position Indicator
Fuel Pressure Gauge
Generator Charging Light
Instrument Panel Lights (Rheostat Controlled)
Landing Gear Warning Horn
Lighted Magnetic Compass (Rheostat Controlled)
Manifold Pressure Gauge
Oil Pressure Gauge
Oil Temperature Gauge
Recording Tachometer
Sensitive Altimeter
Shock-Mounted Instrument Panel
Space for Optional Instruments
Stall Warning Horn
Turn and Bank Indicator
Two Fuel Quantity Gauges
Vertical Speed Indicator

CABIN EQUIPMENT
Adjustable Fore and Aft and Tilting Front Seats
Adjustable and Removable Rear Seat
Adjustable Sunshades
Armrests (Four)
Ash Trays (Four Individual)
Assist Straps
Cabin Heater and Defroster Control
Cigarette Lighter
Control Lock
Cowl Flap Control
Elevator Trim and Indicator
Foam Filled Seat Cushions
Front and Rear Seat Ventilators
Fuel Selector Valve (Three Position)
Glove Compartment
Inside Control for Strainer Drain
Instrument Panel Map Compartment
Key-Operated Door Lock
Key-Operated Ignition
Landing Gear Position Lights
Magazine-Map Pockets (Back of Front Seats)
Outside Baggage Door
Parking Brake
Rudder Trim and Indicator
Suit Hanger
Tinted Windshield and Cabin Windows
Utility Shelf
Ventilation Control
Vernier Mixture Control
Vernier Propeller Control
Vernier Throttle Control
Wall-to-Wall Carpet
Windshield Defroster

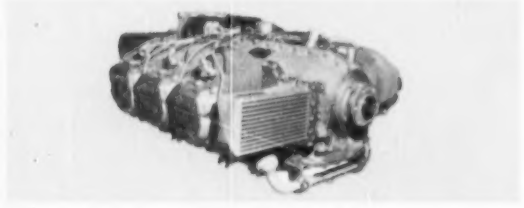
ELECTRICAL
35-Amp. Generator and Voltage Regulator
Cabin Radio Speaker
Circuit Breakers
Dome Light
Headphone and Mike Jacks
Landing Lights (Two)
Navigation Lights and Flasher
Push-Button Starter
Two Electric Auxiliary Fuel Pumps
12-Volt Electrical System

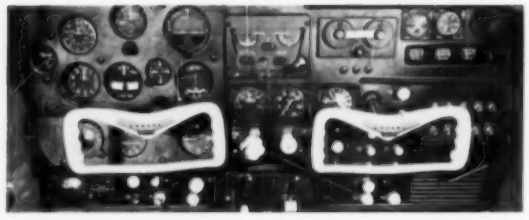
ENGINE
All-Metal, Constant-Speed Propeller (Your Choice of McCauley or Hartzell)
Carburetor Heater
Engine Ignition Shielding
Cowl Flaps
Dual Magnetos
Induction Air Filter
One Engine-Driven Fuel Pump
Propeller Spinner
Stainless Steel Mufflers and Heaters

GENERAL
Anti-Ice Fuel Vent
Easy Access Step
Hydraulic Brakes (Toe Operated)
Key-Operated Baggage Door Lock
Landomatic Hydraulically Operated Landing Gear
Manual Emergency Hand Pump for Landing Gear
Outside Baggage Compartment Door
Para-Lift Hydraulically Operated Flap System
Retractable Tie Down Rings
Sound Proofing
Steerable Nose Wheel
Strut Speed Fairings
Tow Bar

NEW FLIGHT/SWEEP DESIGN–A CONCEPT IN KEEPING WITH TOMO

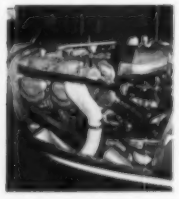
POWER-TO-SPARE ENGINE . . . SIMPLIFIED FUEL INJECTION SYSTEM
The minute you turn up the engine of the all-new 210 you'll experience a smooth, swift surge of power . . . power that adds new speed, range, and performance to the single-engine airplane field! Equipped with a big, 260-HP, six-cylinder, air-cooled Continental engine, the 210 powerplant also includes the outstanding feature of fuel injection . . . a unique continuous flow system offering the most in performance, simplicity, safety, reliability, and ease of maintenance of any fuel injection system available today! It provides each cylinder with **precisely** the right amount of properly proportioned fuel-air mixture to materially improve the horsepower output per engine weight and per pound of fuel . . . resulting in smoother running engine and substantial fuel savings . . . actually permits in-flight "fuel management" for maximum efficiency!





Large, well-lighted "flight command" instrument panel with navigation instruments and engine controls grouped for "eyes-on-the-road" operation and inspection . . . assures easy visibility . . . easy operation. Engine controls are of vernier type, minute control of power, propeller and mixture settings.

All-metal, high-stability wing design provides for high lift, low drag characteristics . . . exclusive conical camber wing tip is provided for added stability and safety.

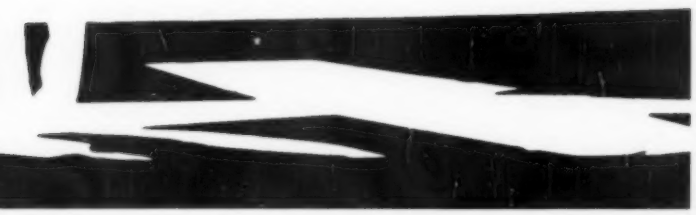


Exclusive new 210 cowling design featuring a fixed lower cowl and a "split" upper cowl with flush mounted "cam-loc" fasteners. Withstands high speeds, is lightweight and quickly removable for engine maintenance.

Big, power-to-spare Continental engine is equipped with an anti-dust induction air system with provisions for heated alternate air as added anti-ice safety precaution.

The fabulous feature of the all-new Model 210 is its positive action, fully retractable Land-O-Matic landing gear. Gear is completely concealed whether up or down . . . provides sleek full flight/sweep configuration. Ground safety switch prevents inadvertent retracting of gear.

OMORROW!



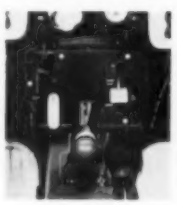
The Model 210 is equipped with flight/sweep fin and rudder . . . which add to its graceful, "silhouette in motion" lines . . . provides greater longitudinal stability . . . gives the 210 the great new Cessna "GO" look for Sixty!

Complete feather-touch trim controls for rudder, elevator, and ailerons are in easy reach of the pilot. A slight turn of the trim control sets the control surfaces . . . eliminates the need for constant control pressures.

Exclusive Cessna Para-Lift hydraulically lowered flaps provide short-field operations for the all-new 210. Big, mechanically synchronized and interconnected Para-Lift flaps may be lowered or raised to any desired position by a smoothly functioning hydraulically actuated system.

Airline-type ventilation and heating ducts located above and to the sides both fore and aft give each person aboard the all-new 210 personalized comfort control . . . and a climate conditioned to individual needs and tastes!

Wing lift strut fillets fairs the wing strut smoothly into the wing and fuselage to reduce drag and increase speed. The all-new 210 also features fully retractable tie-down rings, jack points, and anti-ice fuel vents.



Hydraulic power-pac control for gear and flap systems features simplified "press-to-test" position indicator warning for gear and flaps . . . control handles are in the shape of a wheel or a flap for easy "touch" identification.

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complete advantages
high stability wing, p
positive action fully re
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simplified fuel injecti

The all-new Cessna 210 perfectly fills the need and the speed requirements / of businessmen / The big, power-to-spare, 260-HP engine / with simplified fuel i provides a smooth, safe, cruise speed of 190 mph / extra "space-nothing" e interior material selection and hand-crafted styling adds comfort, convenience, fabulous feeling of fly-away freedom to / a host of modern flight-aid features / which makes the all-new 210 the most complete / the most wanted / package of engine power / performance / and prestige / available today!

built to fill a need in your

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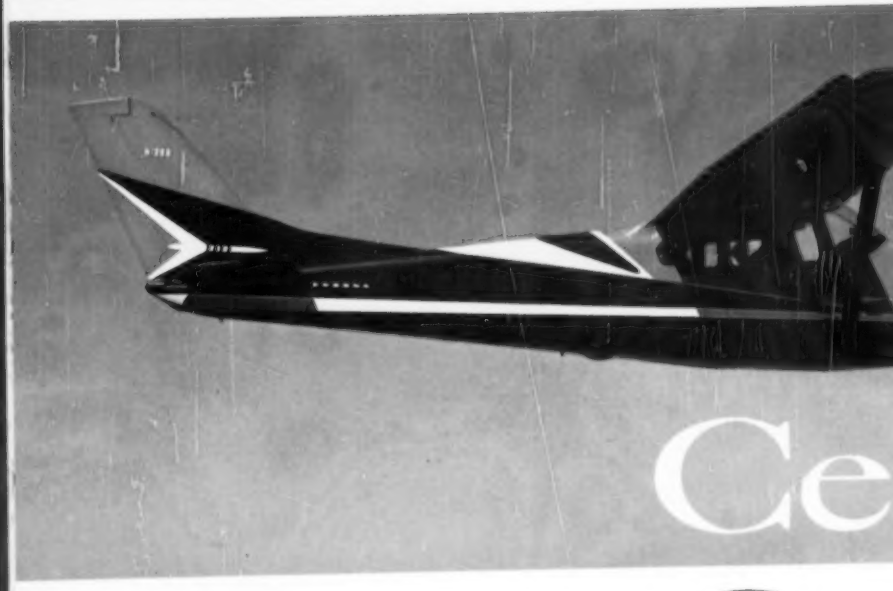

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21

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Cadet Blue — Shadow Blue
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Climber Red — Festival Red
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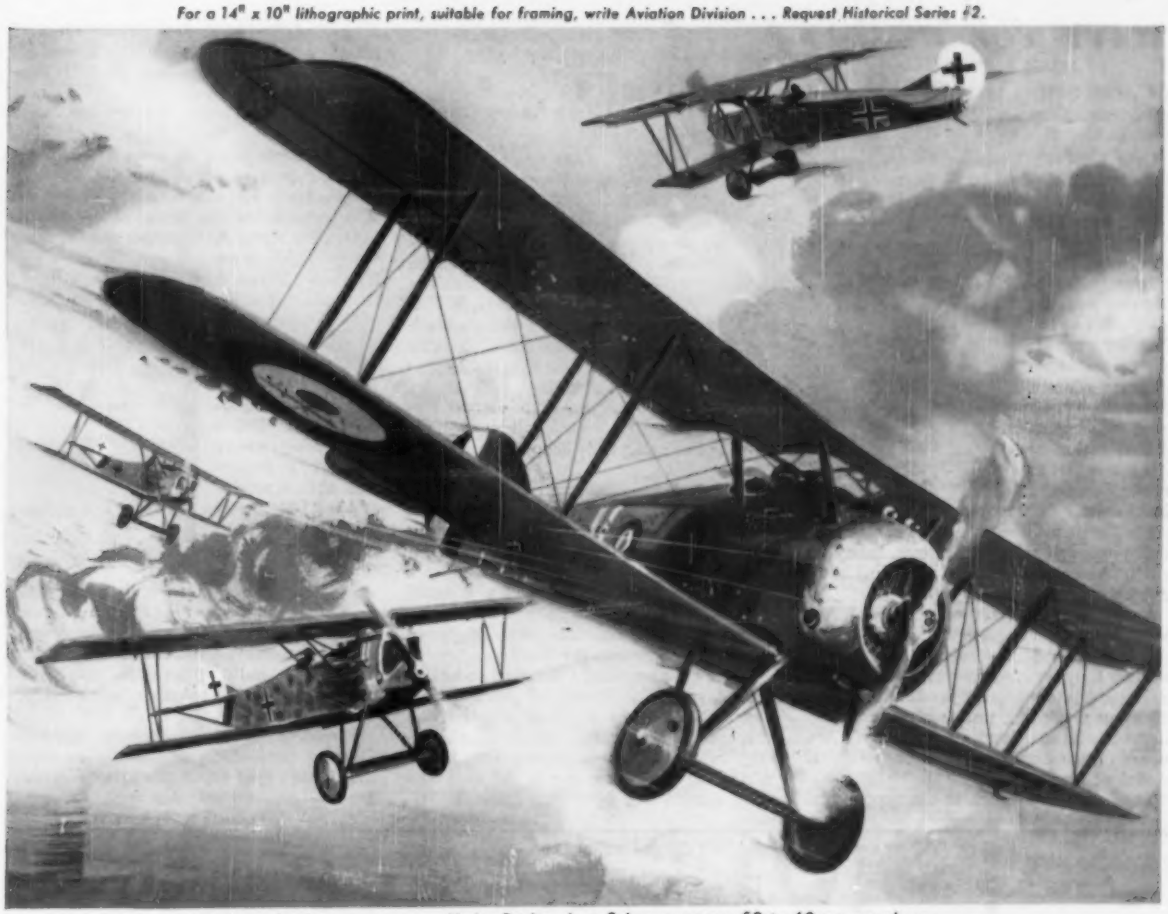

An epic air encounter . . . Major Barker, in a Snipe, engages 50 to 60 enemy planes.

Early War Birds—THE SOPWITH 7F.1 SNIPE

This British plane, the last of the rotary-powered Allied scouts produced during World War I, appeared about three months before the Armistice. Powered with a 230 h.p. Bentley B.R. 2 rotary engine, the Snipe had a top speed of 121 m.p.h. at 10,000 feet, a service ceiling of 20,000 feet, and an endurance of 3 hours. Like most rotary types, it was quick and possessed tight turning ability.

No discussion on the Snipe would be complete without mentioning Major William G. Barker and the heroic fight of this Canadian against overwhelming odds. Barker, a veteran of both the Austrian and Western Fronts, had been ordered back to England for a training command. On the morning of October 27, 1918, he took off by himself . . . having decided to combine his last offensive patrol with the flight to England. At 20,000 feet he engaged first a German two-seater and then a Fokker. He got them both . . . only to find himself surrounded by some 50 to 60 German planes. There was no choice but to fight his way out. He kept the Snipe twisting and turning . . . firing as targets came into his sights. Thousands of bullets streamed down on him, riddling the Snipe and wounding Barker in both legs and one arm. Still he fought on . . . knocking down four Fokkers. Finally he managed to get away and crash land his crippled Snipe just behind the Allied lines.

In what was one of the most outstanding exhibitions of aerial "dog fighting" of the war, Barker had shot down four enemy aircraft with two more listed as probable. Major Barker was awarded the Victoria Cross . . . and the Snipe became the most talked about plane during the closing weeks of the war.

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HAVE YOU READ?

By JAMES F. SUNDERMAN

AIR ACES OF THE 1914-1918 WAR, edited by Bruce Robertson (Harleyford, England, $8.50).

Over 1,500 WWI airmen are featured in this distinguished history-encyclopedia of the men who fought the first air war.

The book divides into eight sections: British, French, American, Italian, Belgian, Russian, German and Austro-Hungarian. Each section, written by an expert, presents detailed biographical treatment of the aces of that nation and a brief military background of their country's participation in the air war. The narrative is richly augmented with photos of men and planes, many of which American readers will find rare and fascinating.

As a reference, this one is tops. Appendices to each section list aces by score, gives their unit of service and the type aircraft they flew. Additional tabular data includes fighter aircraft production, identification markings, unit deployment, and airmen who received their nation's top awards such as the U. S. Congressional Medal of Honor.

The book adds much to the record and lore of first air war. It is a "must" for the writer, the historian and the editor.

THE WAR LOVER, by John Hersey (Knopf, $5).

Hersey, writer, editor, war correspondent, noted novelist *(A Bell For Adano, The Wall, A Single Pebble)* selects the AF crew of an 8th AF, based-in-England B-17 and follows them through 25 missions over Europe during the middle years of the strategic air offensive, WWII.

The pilot, Capt. Buzz Marrow, loudmouthed, over-bearing braggart, displays his notoriety in the cockpit as well as in the parlors of English girls.

His ability as a combat pilot and aircraft commander is unchallenged. His hatred of the enemy is deep and, until his final breakup under tremendous combat pressures, he demonstrates a facade of courage and bravery that is transparent only to a few, his co-pilot, Lieutenant Bowman, being one.

The story is related by Bowman, through frequent flashbacks which build the characters, explore their backgrounds and provide the colorful descriptive mosaic that trademarks the story.

Hersey writes with a detailed technical accuracy rarely found in war fiction. Descriptive scenes of aerial combat, the suspense of long range missions, and enemy mass attacks on Allied formations will bring vivid memories to AF vets who were there.

GRAND OLD LADY: THE STORY OF THE DC-3, by Lt. Col. Carroll V. Glines and Lt. Col. Wendell F. Moseley, USAF (Pennington, $3.95).

Not a single airplane, since Kitty Hawk, has had greater impact on the development of the air age than the DC-3, yet it is unique that the proud record of this aircraft is only now chronicled in book form, more than 25 years after it first took to the air. The authors write an absorbing factual history which begins with the engineering concept of the DC-3 and progresses through a collection of true stories from "Gooney Bird" pilots, both military and civilian.

One cannot help but feel deep appreciation of the men who flew this bird as well as great pride and satisfaction in American air technology which, in its infancy, was able to build an airplane that served more than one generation in useful operational capacity.

However the DC-3 is known: Skytrain, Gooney Bird, R4D or Dakota, its name has a soft spot in the hearts of airmen everywhere. So will this book.

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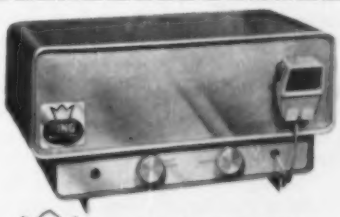

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For Pondering in 1960

GILL ROBB WILSON
Publisher

THE advent of each new year is an invitation to forethought. And none will deny that the need of such becomes more pressing with every annual milestone.

On several occasions during his later years when the airplane had magnified the scope of war, I heard Orville Wright question the kindliness of a fate that had assigned Wilbur and himself to be pioneers of flight.

Nor was Orville Wright the first genius who had been troubled in mind lest unwittingly he had presided at the birth of a Frankenstein. History is replete with tales of innocent but tortured conscience.

We of lesser clay find it hard to understand such self searching but neither do we bear the weight of having changed the course of human events. We must just recognize that greatness has its own unique penalties—and perhaps take some consolation to be among the vast majority.

Nevertheless each chick and child of us, if we deliberate at all on the developments of our day, must sometimes pause in awe. And this is particularly true in the case of the airman who has a yardstick to measure the lines of force which form the grid of future prospects.

In retrospect we may note that it was simple to forecast the inevitability of WWII unless the constitutional governments stalemated Socialism by air supremacy. Nor was it more difficult to forecast Red airpower as ultimate Enemy No. I of the free world. By the logic which flowed from clear understanding of dominant factors these deductions were inescapable. So all of this and much more was put on the record by the airmen over the past decades.

And we can apply it just as simply and clearly to the immediate future. For example, in matters of national defense, two significant developments will be not long delayed. One is the reorganization of the United States Air Force and the other is the reorganization of the entire defense establishment. The former will be dictated by the changing nature of weapons and the latter by the pressure of our national economy.

Over on the civil side, the lines of force are just as clearly discernible. Economic pressures will compel scheduled air commerce to justify its stature by creating a foundation of cargo movement. The performance in behalf of the passenger shows too much disparity in contrast to the performance in behalf of the merchandise. Make no mistake—this is the heyday of the air traveler and he had better enjoy his exclusive privilege while he can. The day that the airlines will think as little of him as do the railroads is inevitable.

Also inevitable is the expansion of corporate flying—the so-called business airplane. Of course it will not be the same aircraft which represents such activity today. The growth of volume in this area will force more imaginative design and engineering, even to the point where the vehicles will tolerate non-professional handling.

In the field of personal activity I expect to see a broad base of recreation and sport organized around the lesser airports—a real incentive for a man to shake off the dust of the politically ridden cities and get out where he can live a little.

But none of this partakes of the nature of things which cause a man to pause in awe of the future. Such things are much more subtle.

For example—Alaska and Hawaii have been made states of the Union, regardless of geography, ethnic origins or domestic convenience. No such political affinity as this in the light of the aforementioned considerations has ever been consummated. Without doubt the American mind was conditioned for this move by the airplane. Is there indication here that Tennyson's Parliament of the World is on its way? Does statehood of Alaska bordering the Arctic and statehood of Hawaii in mid-Pacific hint that concept of government is changing—that world government is around the corner? There are a score of countries nearer to Washington, D. C., than are our newest states. Is the ultimate of NATO a United States of Europe? Is the ultimate of the west The Republic of North and South America?

Is it more important to orbit the globe or increase the average wage of civilization to $5 per week?

Does the Kremlin understand air war sufficiently to realize that global conflict would turn civilization over to Red China?

Could science become a cult in a modern world?

Is the spiritual health of civilization being undermined by overemphasized material standards of living?

Would "One World" be a curse or a blessing?

It is such intruding thoughts as these that give pause at the New Year to even us of the majority. Patently we are caught in the mighty currents of a dynamic stream of history. We can no more disregard them than the Wright brothers could recall their invention.

It would seem to me that our best recourse lies in the processes of education—moral and spiritual as well as academic. History records no instance of a people defeated and conquered at the peak of their character. Perhaps the Soviet would bother us less if the United States bothered us more. It is something to ponder for 1960.

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REVOLUTION IN AIR CARGO

By ELIOT TOZER

An authoritative appraisal of the air freight business — aviation's "sleeping giant" — presents an exciting potential.

The airlines, suddenly alerted to its skyrocketing growth since World War II, are scrambling to inaugurate a huge conversion program to meet the demand.

Top: Artist's conception of the new turbofan-powered Boeing 735 cargo liner . . . "capable of carrying 100,000 pounds of cargo across the U. S. in five hours flight time." Below: The phenomenal growth of air freight has forced American Airlines to convert ten of its DC-7s to an all-cargo configuration known as the DC-7F Airfreighter.

A FEW WEEKS ago, Robert W. Prescott, two-fisted president of Flying Tiger Line, an all-cargo airline, announced plans to drastically slash air freight rates. He said the Tigers had filed a new tariff under which ton/mile charges would be reduced from about 20 cents to 13 cents. In these days of rising costs, that would be enough to make shippers scramble for space on the Tiger line. But Prescott also promised to cut loading time. Next year, he expects to load his planes in an incredible 25 minutes instead of four hours. And then he added—capping his statement with an exclamation point—that the Tigers would haul cargo at nearly 400 mph. "We are," he said, "about to awaken the sleeping giant of the industry—airfreight."

Those were not the wild words of a dreamer. Prescott is tough and hardheaded; he made six kills flying with the late Claire Chennault's original Tigers in China. And he's a solid businessman; his freight line, one of the very, very few remaining of the 1,000 that took off on a wing and a prayer right after World War II, has recently gone into the black—without a penny of government subsidy.

Even before Bob Prescott put his money on the future of air cargo, Raymond A. Norden, president of Seaboard & Western Airlines, a scheduled transatlantic freight line, filed a plan with the Civil Aeronautics Board to fly 25 round-trip all-cargo flights per week on three new trans-Pacific routes at a startling reduction in cost per ton/mile, from 40 cents to 12 cents. He told the CAB: "The new rate structure will generate 425,000,000 ton/miles of traffic during its first year for S&W. Mail and government freight will provide an additional 221,000,000 ton/miles." We are about to make the "break-through" in air cargo, he said.

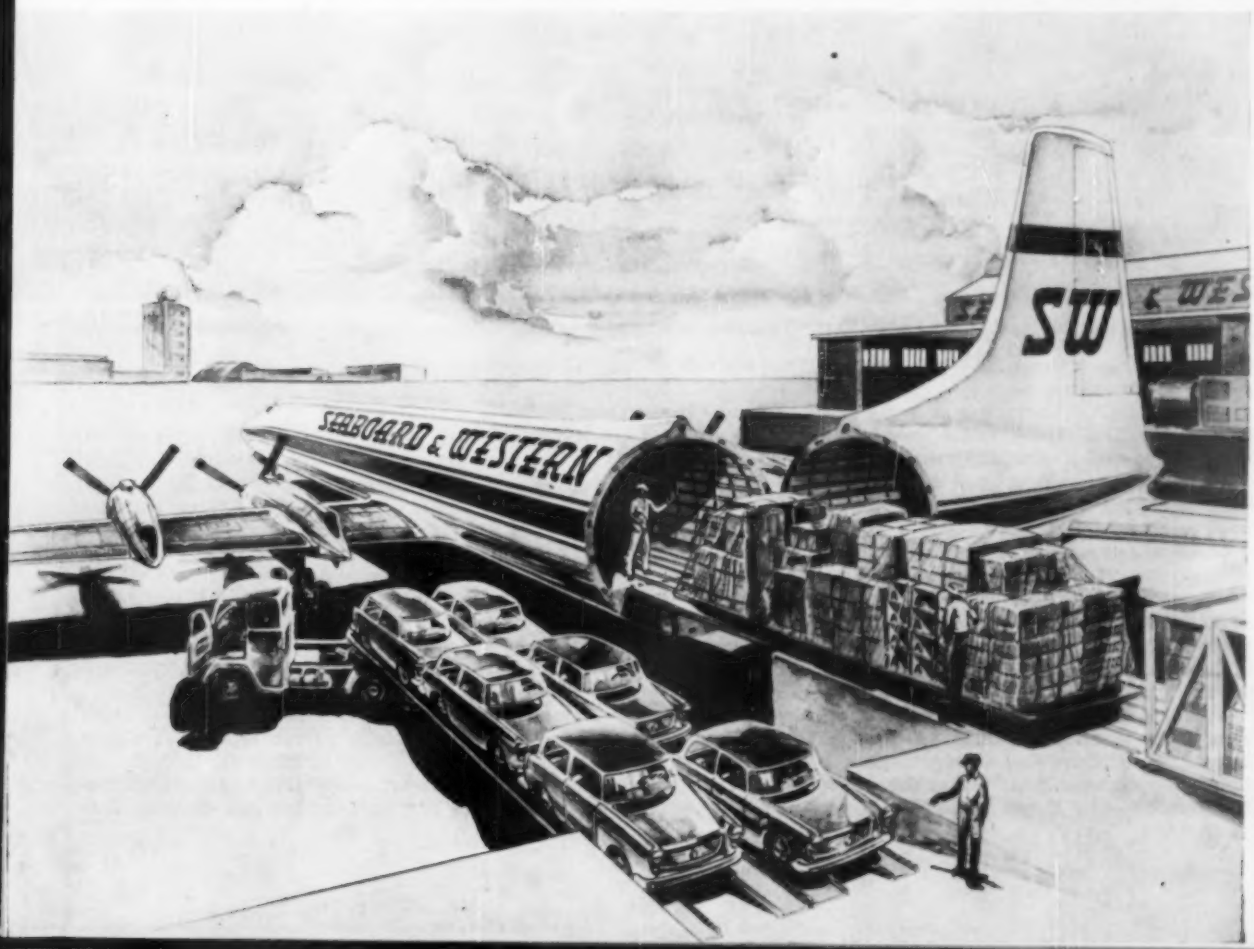
Those are mighty impressive figures, but they are hard figures. And they all add up to one thing—the coming revolution in air cargo. John Brewer, professor of transportation at the University of Washington, recently projected an annual median air freight growth of 30 per cent per year! He added that the potential is far greater. And Elwood R. Quesada, administrator of the Federal Aviation Agency, says that this year he expects the air cargo market to "explode."

What happened? Who rang the bell that woke the sleeping giant?

Air cargo, which moves not only on all-cargo lines but also in the all-cargo planes of the passenger carriers and in the bellies of the passenger planes themselves, has, of course, already shown prodigious growth. Pan American World Airways, for example, logged 32,159,256 ton/miles in 1948 but posted an incredible record (for international carriers) of 100,904,000 ton/miles in 1958. Domestically, American Air Lines flew a mere 2,000,000 ton/miles in 1945 but pushed well over the 100,000,000 mark as it closed the books on 1959. All the airlines together increased their ton/mileage from about 35,000,000 in 1947 to 676,000,000 in 1958. No matter how thin you slice it, that's a whopping increase of 1,831 per cent.

And—get this!—Prof. Brewer says that the cargo carriers have barely lifted the lid of the treasure chest. They should be reaching in and scooping out revenue dollars with both hands. Their potential market is actually six times greater than the market they are tapping—even with the slow, old-fashioned, hard- (*Continued on page* 70)

Seaboard & Western ordered five Canadair CL-44D-4 turboprop air freighters. Sketch shows radical swing-tail design to permit speedy loading.



Any pilot who flies at least 35 but less than 300 hours a year in the course of business will find the answer in a

BUSINESS FLYING *co-operative*

By LOIS C. PHILMUS

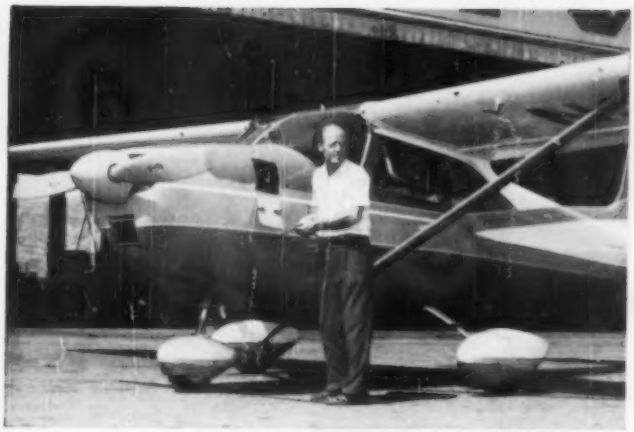
Cessna 310s and single-engine Cessnas form part of the cooperative fleet operated by Sky Roamers Air Travel, Inc. out of Lockheed Air Terminal.

IT IS A BASIC THEOREM of business flying or any aircraft operation that the greater the utilization the greater the economy. And that's one of the big problems facing the thousands of individuals who want and need to fly for business.

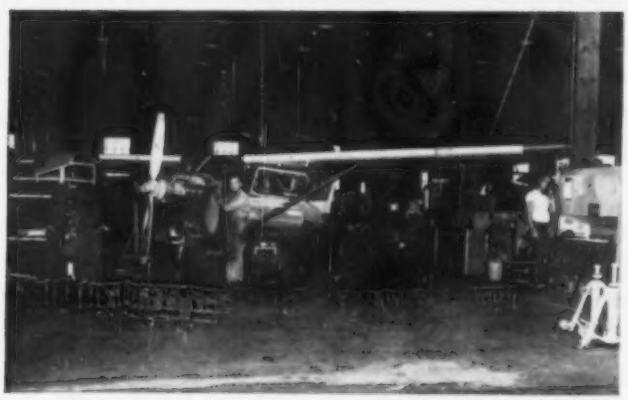
There is a growing trend toward plane owners leasing their equipment to other pilots and charter services when they aren't flying themselves to help offset the continuing cost of depreciation, insurance, storage, maintenance and taxes. Others shun self-ownership and are making more and more use of commercial lease plans and special charter services.

But a group of Southern California business and professional men have found a third, and for them, better way. They are members—160 strong to date—of a business flying co-operative. Based at Lockheed Air Terminal, the co-operative—Sky Roamers Air Travel, Inc.—has a fleet of 18 business aircraft at the disposal of its members. An organization with more than 13 years and seven million miles experience, the co-operative is aimed at those that may have a legitimate need for a private business airplane but cannot economically justify sole ownership of it. It may be because the frequency of use or total annual use falls below an economically sound operating level, or it may be that the individual or business firm cannot afford the total cost of outright purchase or the continuing cost of an aircraft lease.

Founded in the spring of 1946 by a group of Lockheed employees, Sky Roamers has grown from ownership of one Aeronca Champion by a ten-member organization with assets of $2,500 to a highly successful, wealthy organization with impressive assets of $250,000. Growth has been steady and consistent, proceeding at an average annual rate of ten new members and one new aircraft. This



Leo Partridge, member, Sky Roamers Board of Directors, preflights plane.



The Sky Roamers maintenance shop at Lockheed Air Terminal hanger.

year, growth will be more intensified with the addition of twin-engine aircraft. Twenty new members joined the co-operative movement in the first six months of 1959 alone.

Sky Roamers standardized on Cessna equipment in 1949 and established policy is to buy only new, rather than used aircraft, adding the latest models as they come out. The planes are fully equipped with the best radio and navigation gear.

As a natural outgrowth of its standardization, a separately organized corporation, made up of 35 Sky Roamers members, was named a Cessna dealer in June of this year for Burbank and adjacent territory. The new company—Sky Roamers Air Service, Inc.—is working in close conjunction with the co-operative. The Air Service leases additional aircraft if needed; provides the professional services of full-time help for the co-operative—general manager, pilots and instructors. Chief advantage, of course, is that the co-operative will get a break on prices since obviously there will be no selling expense involved.

The co-operative presently operates seven Cessna 172s, nine Cessna 182 Skylanes, one Model 310 with another leased from the Air Service.

Sky Roamers president and one of its founders, Jim Brown, explained: "Standardization means easier transition for our members as they advance to higher performance models. Maintenance is simpler and more economical because of common parts and components. We decided on Cessna because it offered the greatest range of performance types."

Key to the co-operative success is sound management, efficient financing and diversified membership. Every walk of life is represented in the group—manufacturers, salesmen, photographers, lawyers, accountants, engineers, entertainment executives, businessmen. Average flight time per member is about 80 hours a year. If membership were dependent on desk-bound, 40-hour-a-week types, the planes would gather dust on week days and be in over-demand on week ends. Here, however, the co-operative is composed of men who have to fly for business. Pleasure flying is at a minimum.

The very structure of the co-operative discourages the Sunday flyer type. Members each buy a share and pay regular monthly fees. Shares represent the initial fee and can be sold at face value if a member decides to pull out. Despite the investment, one member—who had owned planes for 30 years before joining Sky Roamers—estimated he has saved close to $20,000 since joining seven years ago.

Here's how it works: There are three categories of membership and the stock share is priced to each. The Cessna 172 class currently has 70 members; the Cessna 182 Skylane has 80; and the new 310 category has ten. Stock share in the 172 is $650 and the member pays an additional unrefundable registration fee. Thereafter, he pays a $15-a-month fee to cover fixed costs plus $7.50 per flight hour. A limited number of student pilots are permitted in this category.

The Skylane group invest $1,000 in one share, plus a registration fee of $100. The fixed monthly fee is $22 and the per flight hour charge is $11. Members in this category are also entitled to fly the 172.

Third category is the Model 310. The co-operative is pioneering the use of the small twin in such service.

"Going into twins is a gamble," Brown stated. "Most of the members are not potential users. It opens up a whole new field—that's why we created the new multi-use category whereby a business firm rather than an individual buys the share."

The business firm buys a stock share at $5,000 plus a $500 registration fee but is not limited to operation of the aircraft by a specified (*Continued on page* 58)

The simple little sun compass scored over the sophisticated, expensive computers in the first non-stop jet fighter flight from England to Alaska across the North Pole on a route survey.

JULIUS CAESAR FLIES

By CHARLES F. BLAIR, JR.
Brig. General, AFRes

The crews of the historic jet fighter flight, *Julius Caesar*. Lt. George Wooddy looks on as the author checks his watch, while Captains Bob Titus and Al Kucher stand by after the F-100s had landed at Eielson AFB.

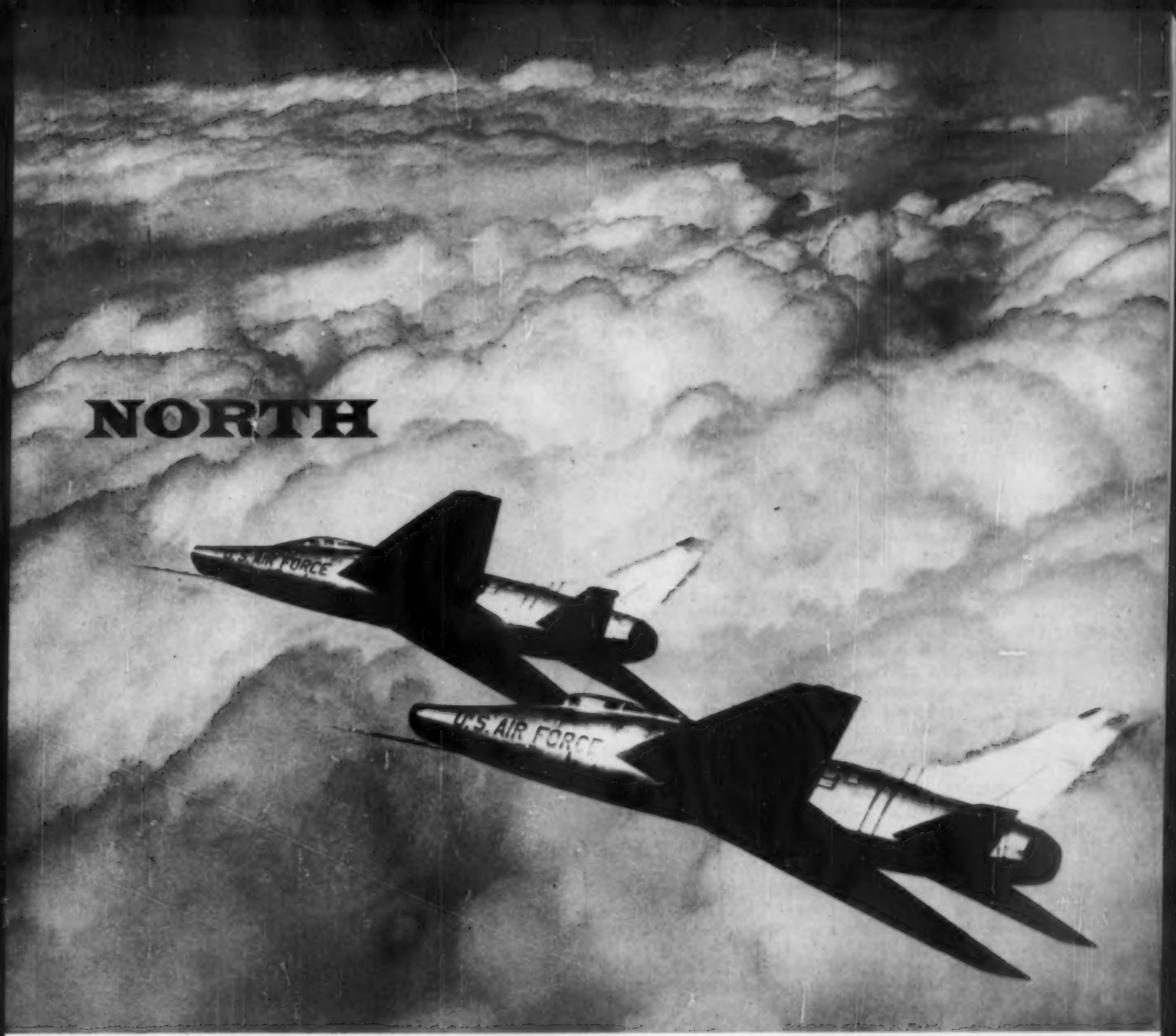
JULIUS CAESAR is ready to roll." The voice reaches across the English fields to the Wethersfield tower.

But there are no Roman legions in battle array. Instead, attention is focused on a pair of droop-snooted birds waiting expectantly on an airfield runway. If the old emperor suddenly came alive, he wouldn't recognize the species. Thousands of years have elapsed. There are no feathers on these birds. We've simply adopted the emperor's name as a call-sign, having been down in Italy the past few weeks on a test mission.

The Air Force is always trying to cram a bigger mission into a smaller package; which is as it should be. This is the gist of our program on this sunny August afternoon at Wethersfield on the outskirts of London. *Julius Caesar* is scheduled to be the first flight of jet fighters across the Arctic Ocean. In the bargain we'll go all the way to the top—to the North Geographic Pole—and thence Alaska.

This route, incidentally, is not identical to the polar routes of the airlines which, with few exceptions, barely infringe the Arctic Circle. Today we're looking for perspective from the topmost point on the globe. The flight is a route survey to test the potential of transferring tactical fighters across the Arctic regions. If the far northern routes prove to be feasible, it will be in the cards to transfer these potent little packages between the Far East and Europe—or vice versa—in less than a day. This potential of going to work quickly in either theatre is not to be sneezed at.

However, a deployment route wouldn't reach as far north as the geographic pole. There's an extra reason for going all the way to the top. We've got some black boxes to play with; computers which automatically help solve the riddle of where an airplane has been and where it is going. In one airplane the electronic brain is a large, ex-



North American F-100s such as these made the long flight from Wethersfield on the outskirts of London over the pole to Alaska.

pensive model. In my aircraft there's a small one, much less costly. Which one will better fill the bill?

Our aircraft for this investigation are North American F-100F Super-sabres, named *Excalibur V* and *Pole Cat*. They have supersonic speed if need be, but not today. We've got too far to go—4,735 miles non-stop. Although there's only one engine, this model of fighter has two seats. A co-pilot makes a plush deal. We can spread out the work.

My colleagues are all F-100 experts. Capt. Bob Titus, who flies the second of our aircraft, is one of the better known test pilots in the fighter business. He is from the Air Force Flight Test Center at Edwards Air Force Base in California. For the past five years Titus has been wringing out all sorts of high performance jet fighters over the California desert, and in Europe as well. He was in charge of navigational tests of these F-100s at Edwards where he inadvertently became a navigator. Events will prove him a good one.

Capt. Al Kucher, who flies with me, is from the Far East Air Force. He is from Japan, as is First Lt. George Wooddy who flies co-pilot for Titus. Kucher and Wooddy are from the first line of tactical fighters; fellows who are scheduled to carry the first ball if the bell should ring.

Col. Jay Robbins, Commander of USAF's 20th Tactical Fighter Wing at Wethersfield, has wished us luck. This balmy afternoon in England finds us overdressed, prepared as we are to become Arctic pedestrians if an engine should balk. However, the need for this attire has been no burden to our spirits. This should be a good trip, and we're a little agog with the prospect. Still it's the kind of journey that could look easy only in retrospect.

I jam myself in the front seat of the lead aircraft. Captain Kucher, in the back, does the same. We're scheduled to

inhabit this cage for 9:31 hours—so says the flight plan.

As we taxi, a matter-of-fact voice from the Wethersfield tower rattles our helmet earphones with an airways clearance. "*Julius Caesar*, you are cleared to Eielson Air Force Base via flight plan route. Climb out on a heading of three-three-three." The man in the tower could easily be stifling a yawn, the clearance sounds that simple. We might just as well be hopping up to Sculthorpe, 100 miles away.

That so-called "flight plan route" calls for certain special arrangements. We'll be meeting our mid-air refueling tankers in some remote places, north of Iceland, and again north of Greenland. There should be a last drink of fuel directly over the Pole. The emphasis today is on precision, for tankers as well as fighters.

The two birds are soon together at the end of the runway, blasting away with the engine run-up. My engine power gauge sticks but a bang with the fist frees it. The needle swings around indicating there is plenty of soup. An outboard movement of the throttle causes the afterburner to erupt with a gratifying roar. Fires burn thunderously in the tailpipes as we lift off at 13:53 plus 35 seconds on the Greenwich clock. Next stop—Alaska.

Anglia Control dictates a flight level of 28,500 feet until we're beyond their jurisdiction. This happens to be a civilized country with many airliners flying about. The traffic control will loosen up after we've passed the Arctic Circle. We're soon past Prestwick, Scotland, and are pushing along at fair speed in the teeth of a stiff quartering headwind. I gaze down on the rugged land of my ancestors with a blank stare and then rummage around in the cockpit for the sun compass. We'll ride herd on the gyros with this gadget. Titus has one just like it. These instruments cost $14.95 each, war surplus.

I'm slightly flabbergasted to discover that one of the reference marks for alignment of the sun compass mount has disappeared. However, after some thrashing about in my cage, the compass mount is eyeballed into a reasonably approximate position.

Before making the fix I had made the mistake of grumbling about the problem through the intercom.

"That's great," says Al Kucher.

This teaches me to stop grousing into the intercom. There's no use disturbing my colleagues with surmountable problems.

But now that the device is reasonably fixed I practice the business of steering by the sun until it comes easy. After Iceland the steering chips will be down. There must be no fumbling with this gadget.

A particularly important chore is to keep track of my wing man. If he should be forced down it will be vital to record his precise position, etc. In such an emergency our automatic computers will help mark the spot.

Titus maintains a discreet separation when he practices his sun steering. When he's not busy with this job he rides closely alongside at times. In this perspective the glistening beauty of his plane is highlighted in the rays of a descending sun. A pole-cat decorates the nose, gazing impudently from behind a barber pole. A luxuriant black and white tail coils around the pole; significantly, we hope.

After leaving the Scottish control zone, we climb to 35,000 but immediately drop back down a few thousand feet when the Doppler radar shows we've popped up into the core of a jet stream headwind. Far below the blue-black North Atlantic is kicking up froth but our engine is running without a discordant murmur and I don't hear any complaints from the *Pole Cat*.

Scotland is 1:20 hours astern when we sight Iceland, a tiny section of its south coast appearing from under a cloud. It's time to start thinking about fuel. There will be tankers from England astride the Arctic Circle to the

On the ramp at Wethersfield AFB, prior to the transpolar flight.

The author conducts a cockpit check on his *Excalibur V*, the lead plane.

Col. Stephen W. Henry, commander Eielson AFB, greets polar pilots.

Walter Welch, manager KTVF, Channel 11, Fairbanks, interviews Blair.

north of Keflavik. They call themselves "Amiable."

"Amiable from *Julius Caesar*."

The first call makes a contact. Our aerial gas stations are ready to do business exactly as advertised. In a few minutes we'll be swooping down on them.

While approaching Keflavik we spot a fighter making a head-on pass. I break left and Titus breaks right. The fighter goes between us. We don't know exactly what he had in mind. At any rate, it's hardly possible we could be "incognito."

We join again and return to the fueling problem, chatting with Amiable as we come. Soon after passing Keflavik we ease slowly down toward the refueling altitude, closing fast on our tanker friends. Their birds are KB-50-Js, a hybrid species that sports a pair of jet engines as well as the four standard piston engines, an economical compromise with the jet age. Their radar man vectors us in from astern and we soon catch sight of them. Those old airplanes may be hybrids but they look mighty good from where we sit. As the fuel gauges drop lower, our affection for them increases.

This job goes to Al Kucher who's the expert. I missed some of the practice sessions this summer while riding herd on another assignment, my regular job of flying Boeing jets for Pan American back and forth across the North Atlantic. This is not the time or place for further practice. We're running against a timetable and are one minute behind the flight plan.

The fuel gauge looks somewhat anemic although there's enough left to return to Keflavik if the refueling apparatus fails to function. But it would only take a few false passes at the drogue to cause us to turn the tankers back toward our refuge at Keflavik, and refuel in a southerly direction.

No need to stew about that. Kucher and Titus are razor sharp, hitting the tanker drogues on the first pass. We start gulping the vital stuff, hanging onto the hoses until the fuel gauges show we're fat and full.

While fattening up we track due north, which will be our route for the next few hours. The north coast of Iceland at the Arctic Circle passes underneath, its tan, treeless cliffs rearing out of the waters of Denmark Strait. After filling our tanks, we back off the hose and fly formation with the tankers for a few minutes. It's a couple of hundred miles across Denmark Strait to Greenland. We'll stick with our big brethren for part of the distance and then top off our tanks. The extra gallons will allow a safe fuel reserve to return across Greenland to Thule if the next tanker rendezvous north of Greenland should misfire.

There are scattered to broken cloud layers lying about, but the visibility is good; so much so that the rugged mountains of Greenland come into view while still 100 miles distant. We go back on the hose, taking a last gulp of fuel before taking leave of our efficient and amiable friends. We've chewed off a lot of mileage and now it's a new flight. Before climbing to altitude there's a glimpse of the dark waters of the Greenland Sea, studded with a myriad icebergs spewed by the glaciers that feed into Scoresby Sound. Jagged, snow covered mountains rise from the icy ocean, forming a vista of stark desolation.

Julius Caesar crosses the 70th parallel of latitude at 32,000 feet, heading due north. This marks the beginning of an 800-mile track along the east coast of Greenland. But to the north of Scoresby Sound we're out of luck for scenery, not to mention the navigational luxury of flying the coastline. Layers of lower cloud suddenly mask the coastal mountains and the far-flung ice cap. Thus we lose all touch with earth except for the fading radio chatter of the distant tanker men now returning toward Iceland. It's like flying in a void except for one tie. Low in the sky off the left wing hangs a glistening ball—the sun.

The sun has become our steering device, correlated with the gyro compass by way of the sun compass. My work with the sun compass has by now become reasonably nimble. The practice session before reaching Iceland has taken the rust off my technique.

The steering job must be a good one. From Scoresby Sound it's 800 miles to the next radio checkpoint at Nord on the northeastern extremity of Greenland, little more than 500 miles from the top of the world. There's only one discordant note to mar one's navigational complacency. On the bow of the canopy slightly above eye level is a tiny standby compass. Its magnetic reading is 60 degrees. It should read 35. The error is 25 degrees, as judged by the position of the sun. A ten-degree discrepancy might be expected in this area of Greenland. But 25 degrees of error doesn't add up. This causes an extra flurry of activity with the sun compass and an occasional cross check with my wing man.

The celestial computer loaned by SAC's top polar navigator, Maj. Dave Haney, gets a furious workout as the bearing of the sun is checked and double-checked. We continue to steer as it dictates without fudging a single degree. The magnetic compass continues to read an obnoxious 60 which goads me into a pessimistic frame of mind. The mental discomfort causes a trace of perspiration around the collar of my flying suit. I entertain visions of flying off into the ocean void that lies between Greenland and Spitzbergen. This would be navigational disgrace, among more disastrous aspects, not to mention letting down my friend, Gordon Graham, sponsor of this expedition, who runs USAF's fighter business in the Pentagon.

Steady, fellow. The sun never errs in its journey across the heavens. It's not subject to the (*Continued on page* 82)

"Chuck" Blair's *Excalibur V*, drag chute billowing out behind, after touchdown on the runway at Eielson AFB, Alaska.

THE AIRMAN'S WORLD

So long as this is a free man's world
somebody has to lead;
Somebody has to carry the ball in word
and thought and deed;
Somebody's got to knock on doors which
never have known a key:
Somebody's got to see the things that the
throng would never see.

Hotter than thrust when the boost is hit,
somebody's faith must burn;
And faster than mach when the rocket's lit,
somebody's mind must turn;
Somebody's got to get the proof for what
the designers plan;
And test the dreams that the prophets dream
in behalf of their fellow man.

Somebody's got to think of pay in terms
that are more than gold;
And somebody has to spend himself to buy
what the heavens hold;
Somebody's got to leave the crowd and walk
with his fears alone:
Somebody's got to accept the thorns and
weave for himself a crown.

It's ever thus as the ages roll and the
record's written clear—
Somebody has to give himself as the
price of each frontier;
Somebody has to take a cross and climb
to a rendezvous
Where a lonesome man with a will to lead
can make the truth shine through.

GILL ROBB WILSON

Illustration by Cal Smith

U.S. AIR FORCE

Back in production, the Kellett Autogiro now is known as the "Cropmaster."

Is the autogiro making a comeback?

By JAMES G. RAY

Flying rotary wing aircraft since 1928, one of our best known 'giro pilots comments on the resurgent interest in the use of "flying windmills".

The Pitcairn-Larsen roadable autogiro demonstrating a direct or "jump" take-off.

WE FREQUENTLY see the word "Autogiro" in the news these days. At least two U. S. companies have moderately large scale plans for its manufacture. The Kellett Aircraft Corporation, located near Philadelphia, is taking orders for an autogiro to be known as the "Cropmaster," and the Umbaugh Aircraft Corporation, Ocala, Fla., has announced sales of a large number of small autogiros of new design suitable for agricultural application and other uses.

Why the sudden renewed interest in autogiros after a period of over 25 years during which there has been no commercial production of this aircraft?

Present interest is in a specialized use of aircraft crop dusting—for which this type of craft undoubtedly has great advantages over other methods of application. Its advantage over the airplane is that its downwash drives the dust or spray into the crop, giving a better application; over the helicopter that it carries the loads more efficiently, giving lower operating costs per acre treated and per ton of dust or spray applied. Its advantage over various ground apparatus is its speed, greater economy, and effectiveness due to the downwash.

However, there is nothing new about these advantages of the autogiro in crop dusting. Its capabilities were thoroughly explored and demonstrated 25 years ago. At that time autogiros were tried out for many kinds of aerial application work, and though their operating cost per treated acre was a little higher than for an airplane, the better results obtained were more than worth the extra cost. The U. S. Department of Agriculture operated a small fleet of autogiros during the middle 1930s and were well satisfied with the results obtained.

The author takes off from the lawn of the White House in a demonstration of the autogiro in the early '30s.

While the presently stressed employment of the autogiro is crop dusting, there are many other uses in which its unique performances outweigh that of all other types of aircraft. Its advantage over the helicopter, as mentioned above, its ability to carry greater loads at higher speed for a given amount of power is the basic efficiency index for all aircraft used in transport.

When measured by this formula, the autogiros of the 1930s were not so efficient as the then current airplanes having landing speeds greater than 60 mph. However, for many flight missions the 15 to 20 per cent poorer performance was more than made up by a number of other benefits.

For one thing the autogiro was completely free from spin and its related phenomena. When speed was too low, something less than 20 mph, it would lose altitude, but there was none of the airplane's sudden falling off. Another great advantage was its ability to take off and land in very small areas. A football field was more than enough space for its take-off, and a landing required still less, with the descent at a very steep angle.

During the early 1930s, when these autogiros were being demonstrated and sold, they were landed in many restricted places as a means of showing their capabilities. A number of landings were made in Manhattan, using piers along North River or at the Battery, and in Central Park. In Washington they were landed in front of the Capitol, across from the Willard Hotel, near the Smithsonian and on the White House lawn for the Collier Trophy presentation ceremonies. Landings were made in Grant Park and in Soldier Field in Chicago and at many other downtown places in large cities over the country. Roof-tops were used for a number of these demonstrations.

The autogiros which made these demonstrations, and the only type of autogiro ever manufactured and sold to the general public in this country, carried the airplane type of control; ailerons, elevators and rudder. This control system, dependent upon airflow over the surfaces, was only effective with some forward speed. The rotor sustained the aircraft even at zero speed, a flight regime where the airplane type of control was inadequate.

After the autogiro had been in production for about a year, and approximately 100 machines had been sold, it was realized that lack of control at very low speeds was causing many minor crackups. A decision was reached, therefore, to discontinue production until the new wingless models with direct control were ready.

Direct control was accomplished by changing the pitch angle of the rotor blades so that the rotor would tilt to a new plane and the aircraft would follow the tilt. Thus the longitudinal and lateral control of the aircraft was placed in the rotor itself where its effectiveness remained constant throughout the speed range because the rotor blades always maintained their speed.

The period during which the early autogiros were in production was for a little over a year in 1931 and 1932. The sale of over 100 machines during that time was a surprisingly large number for that era, reflecting the public acceptance of the autogiro.

During the middle 1930s, for a period of five to six years, a great amount of intensive developmental and test work was done on the new wingless autogiro. All flight performances were improved and the direct control was worked out to a near-perfect performance. Hands-off stability was attained, even in very rough air, with rotors that were remarkably smooth. Jump take-off, accomplished by overspeeding the rotor while its blades were flat and then increasing their incidence, was added, allowing operation from areas not suitable for forward roll take-offs. A small, very successful, roadable cabin autogiro was developed, with means for folding the blades over the tail, disconnecting the propeller, and driving the rear wheel from the engine.

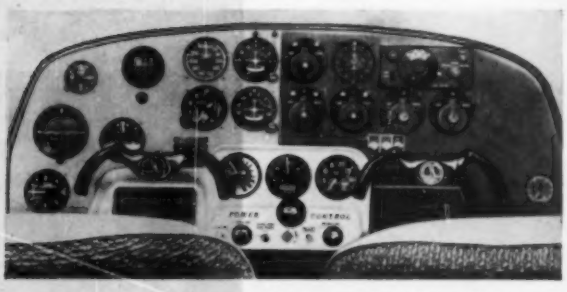
Though a few direct control machines were manufactured for and delivered to the military services, this improved form of the autogiro was not put into commercial production. The reasons for this had nothing to do with any shortcomings of the autogiro (*Continued on page* 91)

Above: Powered by a Continental 260-hp fuel injection engine, the Bellanca 260 can cruise slightly over 200 mph at 75 per cent power.

CHECK PILOT REPORT

The superior performance of the new fiberglas Bellanca 260 will prove a pleasure to most pilots.

By TED DUROSKO



Above: Each group of instruments on Bellanca 260's panel is color coded to reduce pilot reaction time and each engine instrument is directly above the appropriate control (see power group, lower center).

Above: Tom Noonan points out features of rugged nose gear to the author (left). The gear retracts by hydraulic power within four seconds. Right: Large door of molded fiberglas frames Paul Schneider.

BELLANCA 260

THE NEW BELLANCA 260 offers a number of interesting features and I was not sure where to start looking when Paul Schneider, sales manager for Aircraft Service, Inc. (Cleveland-Hopkins) arranged for me to inspect and fly one of the latest models. Needless to say, he didn't have to ask me twice, for I fly an earlier model Cruisemaster and think well of its performance. Schneider roused my interest one day when my Bellanca was in Aircraft Service's shop for some minor surgery, and he mentioned the major changes in the 260.

Aircraft Service, Inc., recently became a Bellanca dealer, and at the time of writing, their 260 had not yet arrived from the factory, so to fly the check ride, Schneider and I got together with Tom Noonan of Cincinnati and flew the checks out of Lunken airport.

Upon our arrival, we found N-7613E waiting. Sitting on its low tricycle gear, the Bellanca 260's smooth fiberglas finish sparkled in the 90-degree F. summer sun and its sleek lines beckoned an invitation to go cross-country.

Getting right into preflight inspection, I found that one of the major changes is the unique covering. The welded tubular steel fuselage, tail group, wings, ailerons and flaps are completely clad in fiberglas which is resistant to weather deterioration, fungus and corrosion.

The cantilever wing is of wooden construction skinned with mahogany plywood. The entire wing is dipped in synthetic resin sealer, then covered with fiberglas and painted with synthetic enamel. Ailerons and flaps are similarly constructed and treated.

The fiberglas molded nose cowling is suspended from the firewall. By unbuttoning the Dzus fasteners and removing the two cowling sections, a quick access is gained to the 260-hp fuel injection Continental engine.

Another major change in this year's Bellanca is the tricycle landing gear. The steerable nose wheel is the same size as the main wheels, and all three are interchangeable. In order to put the Bellanca on the tricycle, the main gear was reversed and moved from the front spar to the rear one which was beefed up to handle the additional load. Retraction is by hydraulic power, the entire cycle taking only 3.9 seconds.

As with other Bellanca models, the wheels (all three on the tricycle model) do not retract all the way. The tires protrude enough to make a wheels-up landing without major damage to the airplane. It is likely though that the propeller, flaps, if extended, and exhaust stacks will suffer from the impact.

Getting into the cabin of the Bellanca is no problem. There is one wing-walk on the right side of the airplane (as you view it from the rear) and a fair-size door. The cabin is three inches wider this year and at shoulder level it is 43 inches across. Inside there are four "contour" seats, each well padded with foam rubber. The front two seats are adjustable for maximum comfort.

Immediately behind the rear seats is a large, upholstered baggage space with a capacity of 186 pounds, which can be reached from the rear seats while in flight, or the outside through a large baggage door.

After waiting for two friends to get into the rear, I slid into the comfortable left-hand seat, and Noonan sat in the right one to brief me on the location of switches and controls. However, much briefing is not necessary, as Downer Aircraft Industries have done an excellent job of a functionally-designed panel. All circuit breakers are grouped on the left wall below and near the panel. They are plainly marked and within easy reach when the pilot drops his left hand from the control wheel.

On the lower left corner of the panel are grouped the flight instruments; below are the fuel, oil pressure, oil temperature, cylinder heat temperature, and allied gauges. In the lower center is the engine control group, and the appropriate instrument is directly above the related control. The tachometer is above the prop control; the manifold pressure gauge above the throttle; and the per cent power indicator above the vernier-type mixture control. In the top center portion of the panel are located the radios, with ample space for additional equipment on the right one-third of the panel. Each group is color coded to reduce pilot reaction time.

Near the floor, between the front seats, are placed the landing gear and flap control levers. Between them is the extending-type emergency hydraulic pump handle. Directly between the front seats at the cushion level is located the fuel tank selection switch, and the gear position signal light. In the interest of safety, especially for the newer pilot, the fuel tank selector also changes the fuel gauge so that it always reads the quantity remaining in the fuel tank being called upon. Also excess fuel not used by the fuel injection metering system is returned to the tank from which fuel is being drawn, rather than to one specific tank.

The Bellanca 260 has two 20-gallon wing tanks as standard equipment, with an auxiliary 20-gallon tank as optional. Range at 75 per cent power, with a 45-minute reserve is about 455 miles; with the auxiliary tank this range is extended to near 752 miles. Unless a pilot plans short cross-countries in this speedy airplane, it would be my opinion that the auxiliary tank is necessary to achieve full cross-country utility.

The airplane which I flew on the check flight was equipped with an aux tank and we had a full fuel load of 60 gallons, plus four good-size persons aboard. The OAT (Outside Air Temperature) at Lunken airport was 90 degrees F. that afternoon, the field elevation is 481 feet, and the wind was eight to ten mph. Upon being cleared by the tower, I fed in the throttle and the Bellanca 260 accelerated rapidly down the runway. At about the 600-foot mark we broke ground and the Bellanca climbed out steadily. Flaps are not used for take-off, and with the gear retracted, the plane went skyward at 1,700 fpm. In just a little over two minutes we climbed through the summer-day turbulence and reached stable air at 4,500 feet over the Ohio river.

When trimmed up and put on the step with 75 per cent power, the Bellanca 260 indicated 190 mph which trued out to 204 mph. According to Noonan at this power setting his Bellanca 260 will burn 14.2 gph; at 62 per cent power the fuel consumption rate is 12.2 gph; and at 55 per cent power, it drops to 11.2 gph. Full throttle speed is near 208 mph, and the aircraft is redlined at 226 mph. Tom Noonan reported that in one of his test flights he dove a Bellanca 260 a little over 300 mph.

An amazing thing about the Bellanca is that it flies well at any speed within its speed range. Abrupt power changes barely disturb its symmetry of (*Continued on page 86*)

Capt. John Ford (left) and Lt. Col. Ralph Leslie check the movement of aircraft under the control of Eastern Transport Air Force, MATS, McGuire AFB, N. J., against the weather briefing which they are receiving on the Weathervision screen, visible at the upper right of the plotting chart.

UP-TO-THE-MINUTE

WEATHER REPORTS BY TV

AND YOU CAN TALK BACK TO THE FORECASTER

By MYRON B. GUBITZ

PICTURE THIS: You're planning to make a short hop. You march into the operations shack of your local airfield wanting the latest weather. The man in charge strolls over to an ordinary-looking TV set in one corner of the room, flicks it on and, before you know it, you're getting a complete, visual rundown on local conditions—via television! No phone calls to make, no tangled mess of teletype data to wade through and decode. And here's the clincher: you can actually *talk back* to the forecaster whose voice you're hearing and ask him specific questions.

It sounds like a pipe dream, but it isn't. It's happening every day. Four of our larger Air Force bases are now using a system known as Weathervision. With simple, closed-circuit television equipment, of the sort used in schools and factories, one forecaster gives regularly scheduled, televised weather briefings to groups and individuals scattered all over his base. By means of an intercom setup, the viewers are able to talk to the forecaster and clear up particular points. The weatherman, using Weathervision, is also able to give special briefings, on a few minutes' notice, to anyone needing them.

The heart of the Weathervision system is the forecaster's console—in effect, his work table. Centrally located at the base weather station, the console has a small, multi-lens camera which can view weather transparencies, facsimile charts and teletype sequences, basic briefing aids used by the forecaster. Remote-control lenses of varying focal length allow the forecaster to change from a wide general analysis to more detailed subjects.

Weathervision has been under USAF study since 1953. In 1956, the first operational system was installed at Richards-Gebaur AFB, Missouri. Since then, with the success of the first system, others have gone into operation at McGuire AFB, N. J.; Otis AFB, Mass.; and Andrews AFB, Md. The Air Force plans to install Weathervision at more of its large bases, where forecasters now must give briefings at widely separated locations in order to meet needs of various squadrons and transient aircraft.

The first Weathervision systems were designed and built by Dage Television Division of Thompson Products, Inc., now Thompson Ramo Wooldridge Inc. More recently other firms, such as General Electric, have gone into the Weathervision "business." (*Continued on page* 88)

GROUNDED AT 60?

FAA's proposed age limit for airline pilots is of concern to all classes of fliers.

By KENDALL K. HOYT

THE IDEA of a maximum age limit for air transport pilots has drawn fire both from the airline pilots, directly affected, and other civil aviation interests who fear they may be next.

No matter how the issue is settled, the debate has raised some questions that all pilots and plane owners, especially the companies with corporate fleets, may well consider.

We shall outline: (1) why FAA proposed this; (2) why civil air groups oppose; and (3) what it may mean to general aviation and business flying.

In brief, the Federal Aviation Agency proposes a maximum age of not more than 60 for air transport pilots and not more than 55 for check-out to command a turbojet aircraft. Parts 40, 41 and 42 of the Civil Air Regulations would be amended to affect scheduled, irregular, and international air transport.

The usual opportunity has been given to file comments, pro and con, as the law requires. But the groups concerned want a public hearing. They want more facts.

While minimum age for pilots never has been challenged, maximum age is a new thing. Fitness is judged on medical evidence, regardless of age.

FAA's proposal is unique in that it is based on what may happen, rather than on evidence that old age has ever been a factor in any airline accident.

What worries the office of Dr. James L. Goddard, the Civil Air Surgeon, is that the number of air transport pilots in their 60s is bound to increase in the next few years. There were none in 1947 and only 16 as late as 1952.

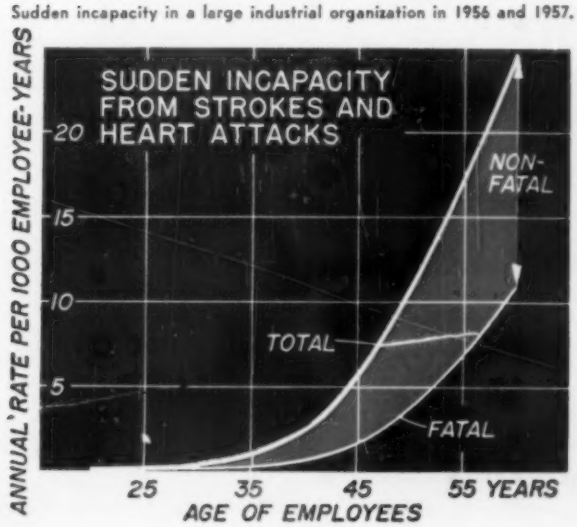
Now there are about 50. It is estimated that there will be at least 80 by 1962 and 250 by 1967. The many pilots who were trained in their 20s and 30s in World War II will be nearing 60 in the next decade and the curve goes sharply upward.

FAA is concerned with "sudden incapacity." The danger of heart attacks increases rapidly after 60. It is argued that a cut-off age must be found somewhere, and 60 is a good, round figure.

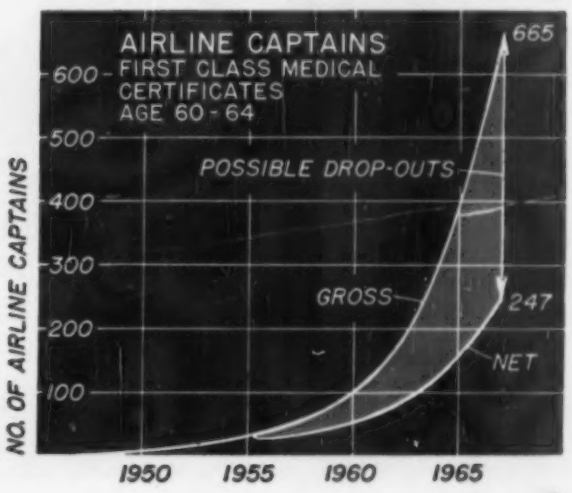
Other worries include slower reflexes and diminished acuity of vision and hearing as a usual part of the aging process. In the jet era, as two planes approach each other at 600 miles per hour, a pilot who sights the other plane a mile away has three seconds to avoid collision. What if grandpa is at the controls?

Alleged slower learning ability is the main reason for the age limit of 55 on jet check- (*Continued on page* 67)

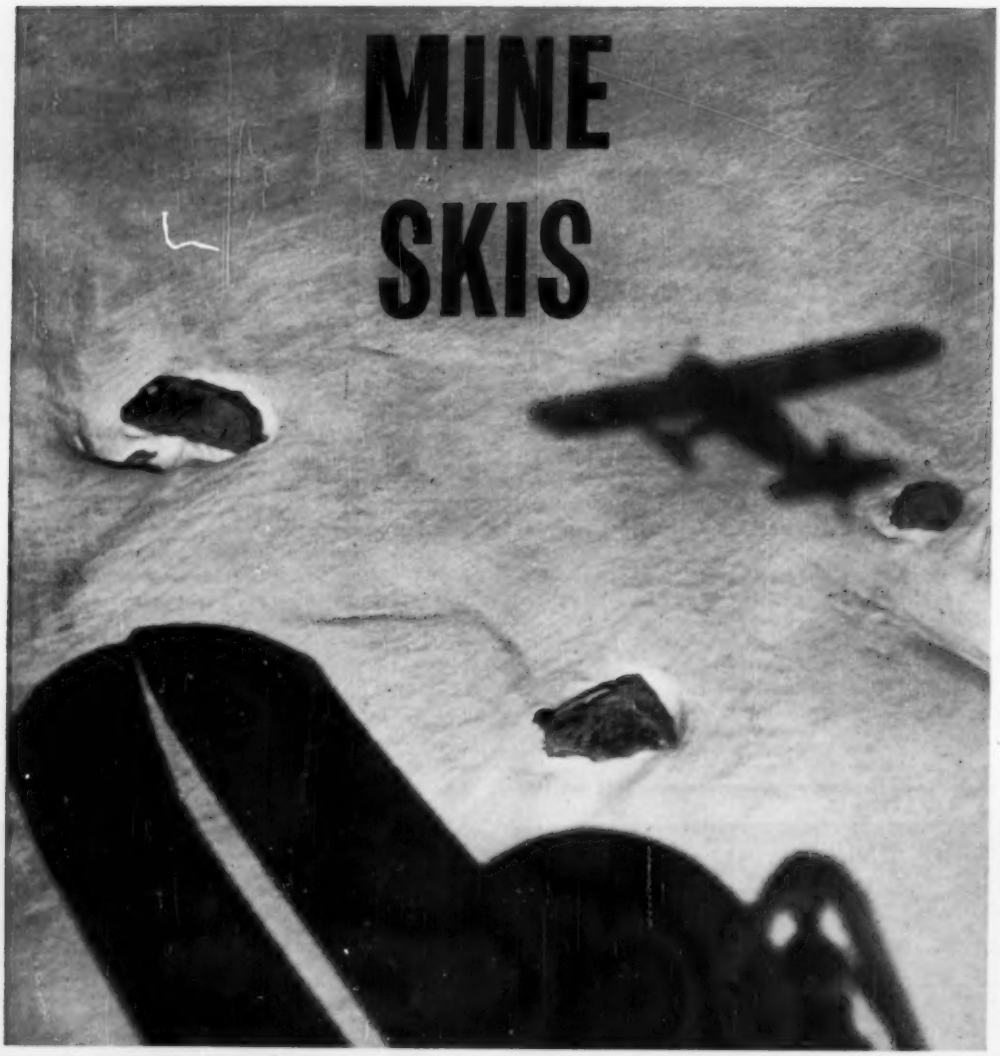
Sudden incapacity in a large industrial organization in 1956 and 1957.



FAA estimate of airline captains past 60 if no one died or retired.



MAKE MINE SKIS



A NEW THRILL AWAITS YOU WHEN YOU TOUCH DOWN LIGHTLY ON THE SNOW IN A SKI-EQUIPPED PLANE. A LITTLE PRACTICE IS ALL THAT IS NECESSARY

By GEORGE W. LAROSE

PUT YOURSELF in a place the size of Alaska, which is roughly two-fifths the size of the United States, cover the ground, the lakes and the rivers with several feet of ice and snow, mix well with a hardy breed of amateur and professional pilots, and you're bound to end up flying ski-aircraft as I did. I can't say that I was too enthused at the initial prospect of this venture but, since associating myself with almost every other type of flying prior to this, it was inevitable that I got to know something about ski flying too.

For an instructor, I went to a well-known Alaskan by the name of Roy Holdiman, a fine pilot with a keen insight on wilderness flying. From the beginning, I discovered there was much to be learned about this medium of flying skis. What impressed me especially were the extremes in power and control movements necessary for taxiing and take-off, as compared to those used in wheeled aircraft. With snow conditions of varying depths, taxiing is a real problem upon occasion. Depending on the surface beneath, and it can be anything from deep snow to glare ice, taxiing is an art in itself. You have to use just the right amount of power to keep the aircraft going at a steady pace, usually fairly slow. The important thing to remember is to keep it moving, particularly in deep or wet snow.

Once airborne, the aircraft handles much the same as its wheeled counterparts, although slightly slower in cruising speeds. It trims well and will not pendulum like some float planes do. In a high speed dive, however, some ski installations, with weak forward bungee cord riggings, may tuck down rather suddenly when high speed is reached; obviously, this could be somewhat hazardous if it occurs close to the ground. In flight, the skis ride a few degrees nose-up to insure that their toes are up when the aircraft touches down during landing.

Let's try some take-offs now. As soon as the aircraft starts to slide forward, the pilot must be prepared to use quickly and effectively the rudder and aileron for directional control, particularly the former. The aileron gets into the act during unlevel and crosswind conditions. Once positive rudder control is reached, there isn't much to it under average conditions. A slight back pressure will take the aircraft into the air in much the same manner as the conventional aircraft.

Deep snow is something else, however, and a different technique must be employed or you'll find yourself running out of available space before getting airborne. Acceleration is slow and conceivably the snow could be deep enough to prevent a take-off, regardless of technique or skill. But there are ways to combat deep snow, up to a certain point. After selecting the direction for take-off, a test run should be made on the heading selected and the aircraft taxied back parallel to the pre-selected heading. Then, swinging the aircraft back into the tracks, another run is made in the same direction. You'll find that the skis now have a tendency to ride in the old tracks and widen them. Let them stay there, that's what you want. You'll notice also that you're making better progress in the second run. If the aircraft at any time feels that it wants to keep on accelerating, go ahead and try to get it into the air. Usually the process has to be repeated several times until a path or track is sufficiently trodden down for take-off. The deeper the snow, the harder the work, and you'll find that it takes skill and technique to hold the plane in the rutted tracks using rudder, ailerons, elevators and throttle.

LET'S ASSUME, for instance, that we are taking off in a condition of deep snow. We have learned how to make a beaten path but there are a few things about the actual handling of the controls that one should know. The most important is the angle of the nose, or the use of elevators. The angle assumed is somewhat higher than for conventional two-wheel landing gear aircraft during take-off, but not high enough for the tail ski to dig in. On the other hand, too much forward stick will tend to bury the main skis. Nose almost on the horizon is about the position for take-off. After a while you will get the feel of it and realize that the ideal angle is a very slight nose-up attitude. Once this angle is reached, let the aircraft accelerate as much as possible and you'll find that only slight additional back pressure will put you in the air. Notice that I said "as much as possible." There is often what appears to be a moment of staggering at this point, particularly in very deep snow, and you'll have to keep the necessary back pressure to the (*Continued on page* 74)

A Cessna 180 with Federal ski-wheels. Skis may be raised or lowered while in flight or on the ground by means of hydraulic controls in the cockpit.

The sensational growth of NORTHROP INSTITUTE

Co-founders of Northrop Institute, John K. Northrop, left, chairman of the Board of trustees, and James L. McKinley, President, at Northrop Hall.

Founded just six months after Pearl Harbor, the atmosphere is academic but with due emphasis on practical applications of engineering principles.

By **GILL ROBB WILSON**
Publisher

This engineering drafting room at Northrop Institute has been called the cradle of design.

"WHAT would you first like to see?"

We had emerged from the administrative offices of the Northrop Institute of Technology hard by the vast complex of air age industry and commerce which centers around Los Angeles International Airport. Almost within listening distance of our ears the schedules of aircraft headed for practically everywhere on earth were being announced in ceaseless routine. Yonder a sign proclaimed, "The Home of the X-15"—America's project to put a man into outer space—to orbit the earth—to explore frontiers which existed only in imagination when Northrop Tech was founded a mere 18 years ago.

Now, my friend, an instructor in engineering at the school, and I were momentarily caught in the eddies of young men hurrying through corridors to classrooms, laboratories or drafting lofts. But we worked our way out of the main stream of traffic and I told him, "I'd like to sit out there on a campus bench for a while and look at the faces of the student body."

"That's a good choice," he agreed. "We presently have an enrollment of some 1,600 and you'll notice a broad representation of young men from other countries—more than a score of different countries, in fact. But whether from the United States or from abroad, a boy must have something on the ball to absorb the quantity and quality of education we give him within the time limits established. The number of freshman enrollees who can't stick —who can not or will not bow their backs to the job—is always considerable. But the end product—the student who leaves here with his degree or whatever specialization of education he came here to attain—is one to be proud of. Of course, they are our sole reason for existing and, naturally, we think they are unbeatable."

So for a time we sat in the California sunshine and watched the young men of Northrop. Frankly, I'd rather look at an audience than any landscape I ever saw. A distinguished friend once told me that his favorite recreation was riding the New York subways and observing the feet of the throngs which ebbed and flowed in the underground cars. He declared he had learned a vast amount about human nature by watching those subway feet. My scope is aimed differently—audiences mostly. That's why I've always taken the opportunity to address so many groups of every kind and description—each audience is a new opportunity to study people. And for sure the greatest study of man is man.

And what were our impressions of the student body at the Institute? I guess the outstanding impression would have to be the aura or earnestness that marked the faces. Without a shadow of doubt the campus was a purposeful place to the groups and individuals who hurried hither and thither. These young men knew what they wanted.

ANOTHER impression was that there was no pattern into which individuals seemed to fall. Personality was everywhere evident. I've noticed this many times previous in contact with skilled groups or young men on their way to development of high skills. Personality seems to be an ingredient of intelligence. Technicians and engineers are often touted to be oblivious to sociability but this is a half truth. They are merely oblivious to the trivial. Introduce some subject which poses a problem and they fire up like an afterburner on a jet fighter.

But this is no critique on the student body of Northrop Institute of Technology. I only wanted to bring out the fact that the most impressive thing I saw on my visit to the campus *was* the student body. (*Continued on page 77*)

To fully appreciate the tremendous role the airplane can play in accelerating the growth and improving the economy of a community and a region, fly out into the booming, dynamic southwest where mushrooming air traffic and flight activity keep constant pressure on cities to improve air facilities. The following report from Arizona's Valley of the Sun pinpoints the impact of explosive population growth on aviation and the problems of keeping an airport geared to such growth.

Bill Ralston, airport manager, Art Bethancourt, operations manager and Melvin Harrison scan Sky Harbor.

PROSPEROUS PHOENIX

Sky Harbor EXPANDS AGAIN

By FRANKLIN D. WALKER

Inside the main hangar at Sky Harbor a variety of aircraft are stored, 95 per cent of which are business planes.

G. E. distributors board their Apache for business trip.

FOR THE SECOND time in less than ten years, the prosperous desert metropolis of Phoenix is launching an expansion program at Sky Harbor airport. This time, the objectives are to provide facilities needed by 1965 air traffic and to prepare for 1985 and later.

To those who must supervise the new expansion program, the memory of September 13, 1952, is still bright. That was the date the present Sky Harbor terminal building was opened and dedicated with the wistful hope that it would accommodate Phoenix air travelers for the next ten to 15 years. But the fantastic growth of the city and the Valley of the Sun in which it is situated soon dashed that hope.

It became obvious within three years after its gala opening that the terminal soon would be too crowded and by 1957 it was congested and inadequate to serve the market. And every other part of the airport's physical plant—aircraft loading positions, aircraft parking area, auto parking space, hangars, transient headquarters—was overloaded. In addition, the runways were too short to handle jet transports.

At first glance, it would seem that someone goofed in preparing the blueprints and the estimates on which the prints were based. Nobody goofed. The city's rate of growth far outstripped the rosiest forecasts.

Like many cities in an earlier era, Phoenix learned the

Art Coons (left) hands tire to John R. Holefelder, pilot for the Blakely Oil Co., loading helicopter for rush delivery.

Virtually every type of aviation uses Sky Harbor and the rapid development of Phoenix as an industrial center has pushed business flying to the forefront.

Sky Harbor Airport showing airline terminal (extreme left beyond runway), old hangars (right foreground), and new hangars opposite them.

hard way that if you build a better airport, the world will beat a path to its runways and then you must build a still better airport, etc.

If only tourists beat a path to Phoenix, the airport problems would be less serious. Tourism still is important to the city's economy and probably always will be, but it is the rising tide of people who have chosen the city as a place to work and live that has made the big difference.

The city has become a major urban center in Arizona, as well as in the southwest, and as such it provides a channel for the flow of goods and services between the national and regional economies. It is increasing its strength as a regional center, while achieving increasing importance in the nation. The most important structural changes in the Phoenix economy have been in the relative decline in importance of agriculture and the increase in the importance of manufacturing activity.

The population of the Phoenix metropolitan area, now close to 600,000, is growing five times faster than the national rate and is expected to pass the 1.5 million mark by 1970. Every indicator of economic progress is moving steadily upward and, alongside its multi-million dollar agricultural industry, this region is building an industrial empire destined to become the center of the nation's electronics complex.

With this quickening of its economic pace as its population soars, the city requires adequate air transportation to connect it with other communities throughout its market area and to give it direct access to other national and regional centers. Airport development at Phoenix is not a matter of choice but of necessity. No one is more keenly aware of this than the city's leaders, and airport planning always encompasses the needs of every segment of aviation—business and private flying as well as scheduled air services.

While the rapid increase in scheduled air service to take care of tourists started the boom in aviation at this resort area, the development of the area as an industrial center has pushed business flying into the forefront among flight activities. And private flying for sheer pleasure can be enjoyed the year round, because Phoenix is virtually free of fog, smog, rain and ice. In fact, airport officials point with pride to this astonishing record: Sky Harbor airport has been closed by bad weather less than 15 hours in the past 30 years.

It is not surprising, in an area where industrial growth is so rapid, that virtually every type of aviation uses Sky Harbor, which the chamber of commerce boldly identifies as the front door of the Valley of the Sun. There are five airlines (American, Trans World, Bonanza, Frontier and Apache, hundreds of owners, operating their own aircraft for business, private fliers, (*Continued on page* 88)

I'm still learning

CRUISING INTO CLERMONT, Iowa, last summer, I landed on a lush grass strip fronting a hangar that obviously had started out in life as a barn.

Inside, on a wall pencil-scarred by generations of doodlers, an old crank telephone stuck its neck out, while a pot-bellied stove squatted nearby. Scattered on a deal table were some technological books, several worn maps and the two latest issues of FLYING.

This was our first stop on a 6,000-mile personal appearance tour of State Fairs in Iowa, West Virginia and New York. Though our traveling caravan was my Twin Apache N2210P, we were troubadours in the ancient tradition—carefree and happy.

Beside me as our little troupe winged through the air was Dominic Frontiere, my musical conductor-arranger and co-pilot. And it seemed to me I could catch scraps of chit-chat, like an obbligato, from Charlie McCarthy and Mortimer Snerd in the back of the plane:

Mortimer: Are you a pilot, Charlie?

Charlie: Are you kiddin'? I once flew a plane so high I ran out of gravity.

Mortimer: How did you get back down then?

Charlie: I got out on the wings and stomped 'er down.

Mortimer: Charlie, what is gravity?

Charlie: Well, when you jump up in the air, do you know why you always come back to earth?

Mortimer: Sure. Because I live there.

Charlie: I'll try it another way. Do you know why you can't coast uphill on your bicycle?

Mortimer: Because I ain't got no bicycle. The questions are getting easier or I'm getting smarter.

That's how it went all through the early days of our tour.

Coming upon Clermont was part of the richly rewarding, thrilling experience of flying the State Fair circuit. We had been on the grass-carpeted ground only a few minutes when a typical Iowa farmer ambled over. Very good natured. Grassroots all the way.

"Howdy, folks," he said cordially. "Anything I can do?"

When I suggested that a storm might be coming up and wondered aloud if I should stake down the plane, he said he'd be glad to do that if it became necessary. So in my

Left: Edgar Bergen demonstrates the "dancing hair" trick for a fascinated audience at Clermont (Iowa) Airport. Below: About to "get the show on the road" in the author's Twin Apache. Opposite page: Two well-known radio and TV personalities, Charlie McCarthy and Mortimer Snerd (as co-pilot) join Bergen's aerial caravan to tour State Fairs.

A famous radio and TV star and his troupe, modern aerial troubadours, recount some of their experiences in flying a light twin around the country for personal appearances.

about flying - by flying

By EDGAR BERGEN

best mentor manner—Charlie and Mortimer know it well—I told him how to nose the plane into the wind, and very carefully explained why. While I paused for breath, the farmer broke in with an agreeable, "I understand." Then he added politely, "I was a bomber pilot in the last war."

My discourse dangled unfinished in the soft summer air.

After filling my date at the Fair, we were about to take off from Clermont when a heavy rainstorm delayed our departure for three hours. To kill time I helped Charlie and Mortimer put on a little show. As we clowned around, the audience filled out from a few stragglers to a laughing, attentive group of 25.

They were 25 of the nicest people I've ever met. Because of them I know now where good manners have gone. They've gone to the farm.

One of the little stunts I pulled on that group I especially recommend for flyers—because they can get out of town so fast. The stunt goes like this:

I ask my audience (they were mostly boys and girls in the little Iowa airport) to join hands in a semicircle before me while I place a hair in a pan of water. I explain to them that we now have enough animal magnetism from body electricity so that, when I hold my finger three or four inches above the pan, the floating hair will stand up on end and dance in the water. I urge them to draw in and watch closely. Naturally, the hair is a little slow about going into its dance. Then, at the psychological moment, I lose patience and slap my hand down on the water in disgust. That's when everybody gets sprayed. And that's when I get my laughs. Or get out.

With Clermont setting the pleasant pace, I thought our whole tour would be a sweet summer breeze. As a matter of fact, it squeezed me into one of the two tight pinches I've had in all my personal flying experiences covering 20 years; years in which I have never had occasion to use my parachute or make a forced landing.

I learned about flying by flying. I'm still learning that way—which may be why to this day some of the refinements of academic aeronautics escape me.

When I bought my Twin Apache, the salesman pointed out that the plane was equipped with three radios and that with such gear it would take a (*Continued on page 86*)

With a 15-gallon nose tank plus an auxiliary eight-gallon tank, the 65-hp Aeronca Chief has a range of almost 486 miles.

CHECK PILOT REPORT:

AERONCA CHIEF

Here's a used plane which is excellent for developing cross-country technique.

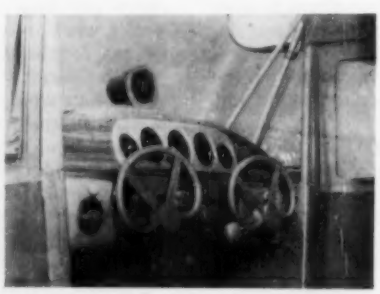
By TOM DENNY

IF YOU ARE LOOKING for a two-place, side-by-side lightplane that is as easy to fly as a Piper J-3 Cub, and yet wish an airplane with more range, take a close look at the Aeronca Chief built during 1946 and 1947. You can recognize it by its distinctive Aeronca lines and its family resemblance to the popular Aeronca Champion.

Since the Aeronca Chief is no longer in production, it is available only on the used plane market. Depending upon the time since recover, time on the engine, condition of the propeller, and number of instruments on the panel, the price runs from $1,000 to $1,550.

Though its wing span, height and length is about the same as its trainer brother, the Chief is more "plushed up" in the cabin and carries considerably more fuel. With a 15-gallon capacity nose tank, and an auxiliary eight-gallon tank, the Chief has a range of some 486 miles. As the 65-hp Continental usually burns about four gph, the plane can stay in the air 5¾ hours maximum.

With a standard pitch wooden propeller, the Aeronca loaded with two persons and 23 gallons of fuel will cruise a solid 85 mph at 2,150 rpm. This is not business-plane fast, but it is ample for the practicing student pilot, or the week-end pilot who has a strong desire to get up in the blue.

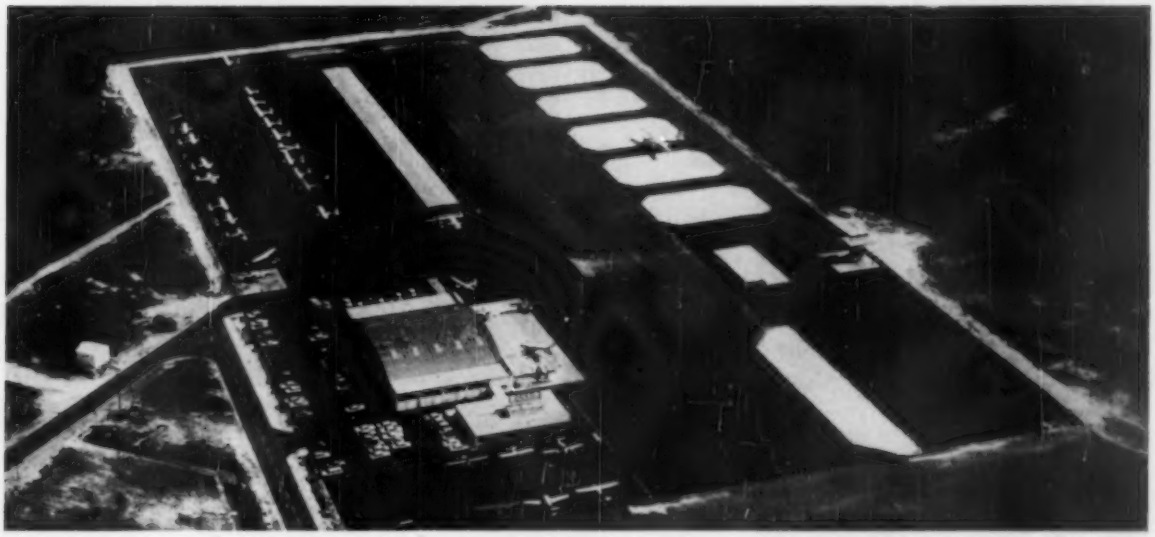


The Chief is equipped with dual control wheels. Engine controls are centered within easy reach.

For the student or private pilot who is in the stage of developing his cross-country proficiency, the Aeronca Chief can serve in good fashion. The cruise speed of 85 mph is fast enough to make a ride enjoyable and at the same time slow enough to allow the student plenty of time to determine check points and do a little paper work in the cockpit. Also the generous fuel supply allows a good margin for error, should the student experience difficulty in locating his field of destination.

Climbing into the side-by-side Aeronca Chief calls for a little doubling up, but it is not too inconvenient since the airplane is equipped with dual control wheels which extend from the panel rather than a control stick protruding from the floor as in the Champion. The seats have comfortable angles, are average in width, but two 180-pound persons will rub shoulders. Engine controls are centered and well within reach from either seat. The main fuel valve control is located on the panel while the auxiliary tank control valve is on the left wall just forward of the door. The elevator trim control is located overhead.

Since there is no electrical system, the 65-hp Continental must be started by swinging the prop. Originally Aeronca built in a mechanical device to do this, (*Continued on page* 93)



Aerial view of Sunny South's new site. Area covers 16½ acres, has extensive shop facilities, hangars and tie-down ramps for 150 planes.

SUNNY SOUTH OPENS NEW QUARTERS

A well-equipped and attractive facility geared to serve business flying.

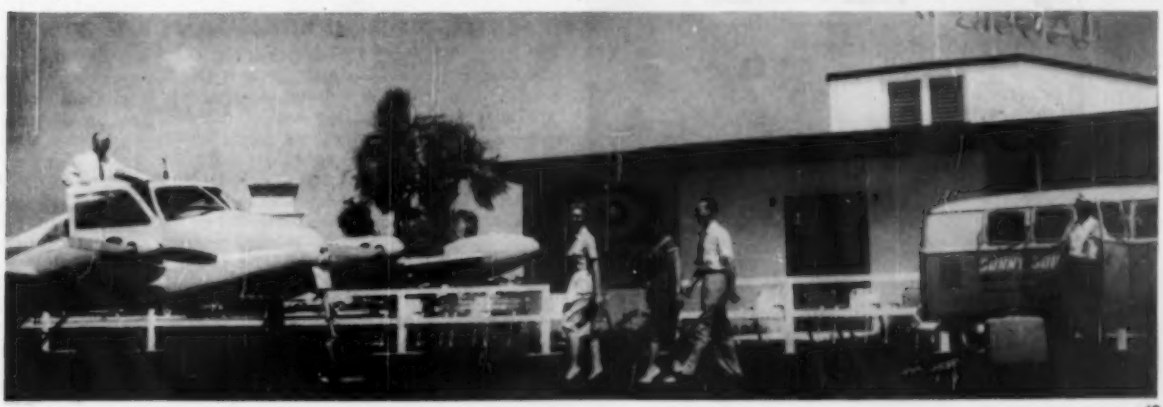
by HANS GROENHOFF

SUNNY SOUTH Aircraft Service, oldest and largest Cessna dealer in the south and third largest in the world, formally opened its new facility last fall at the Broward County International Airport, Fort Lauderdale, Fla.

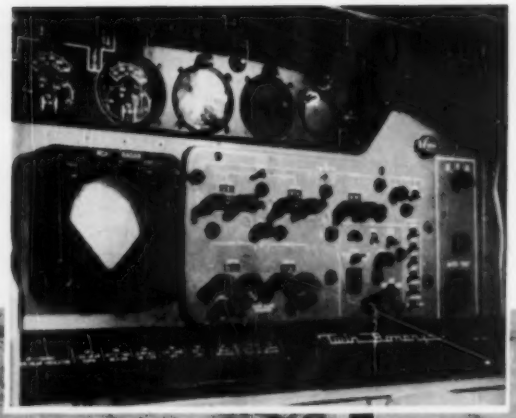
Only ten years ago, Sunny South was in the bush league, operating from a turf strip on the edge of Miami with a few planes, a small hangar and a hut of an office. When the old strip had to be plowed under to make room for an expanding city, the operation moved to its present location, making its quarters in old, World War II buildings, where it expanded its service and began to grow. Vast business and industrial growth of southern Florida soon had a telling effect on Sunny South. Within a few years its quarters have become inadequate and president Robert Uricho, Jr. set his sights for a new plant.

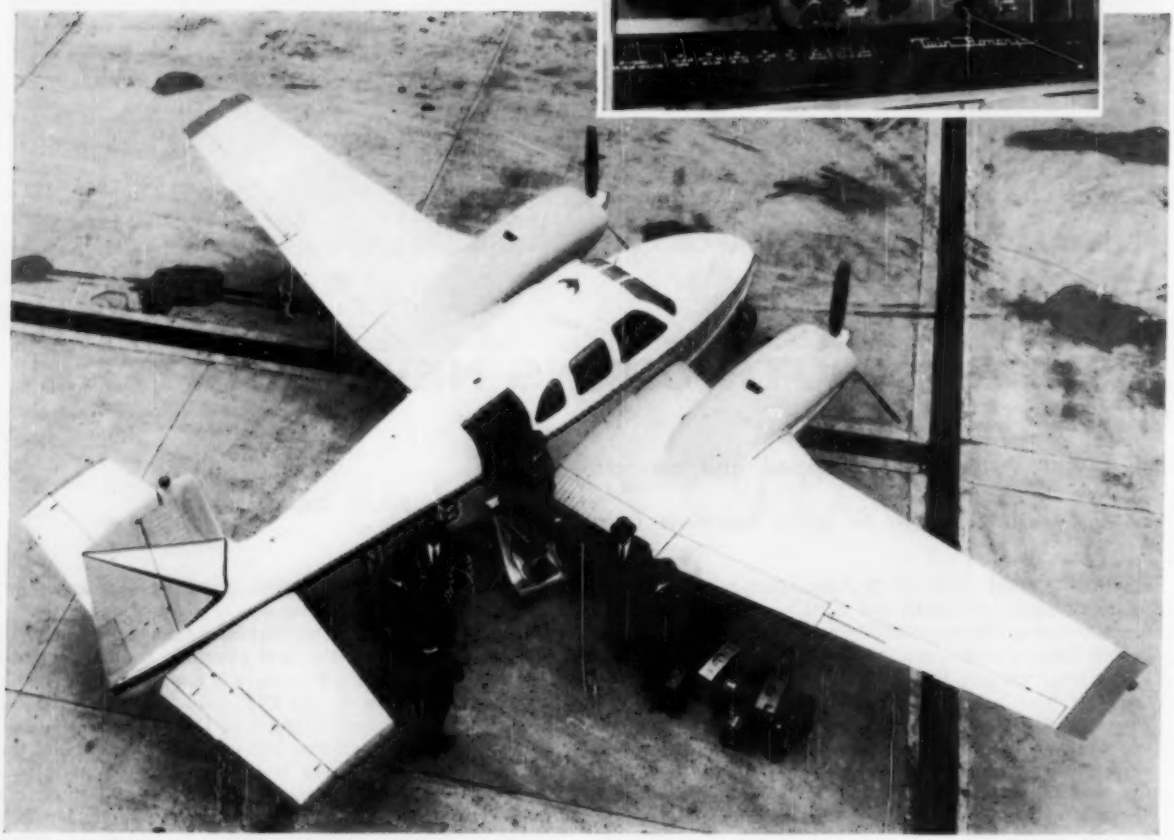
Today, this new plant represents an investment of $325,000 and is one of the most complete and best general aviation facilities in the south. It has done business in excess of $3 million during 1959 and at the height of last year's season serviced as many as 120 planes in one day. Higher volume is expected this year. To take care of the prospective growth, three and a half acres of additional land have been purchased, more hangars and shops are being built. But even this may not be enough. Uricho's vision extends to the jet age of business and private flying and he is getting ready for it. END

Passengers disembark in front of modern administration building attractively furnished and air conditioned. Even bus service is provided.



FLYING NEWSREEL





BEECH TWIN BONANZA FOR 1960

OF ALL 1960 Beech Aircraft models, the Twin Bonanza has the most apparent changes. Gone is the "over-the-wing" entrance to the cabin and, in its stead, access is gained through an "air-stair" door in the side of the fuselage. In addition, wing tips have been squared off in order to improve aerodynamic efficiency. Same wing tip treatment has also been given to the 1960 Bonanza M35. Gross weight of the H50 Twin Bonanza, powered by two 340-hp Lycoming supercharged, fuel injection engines, has been increased to 7,300 pounds and the useful load to 2,820 pounds. It has a cruising speed of 223 mph at 15,200 feet on 70 per cent power and a maximum range of 1,650 miles. Also offered is the standard D50C Twin Bonanza powered by two 295-hp Lycoming high compression engines. It is also equipped with air-stair doors. For those who desire all-weather capabilities, there is available, as optional equipment, weather radar and lightweight Goodrich de-icers. Both models are FAA approved for the Aerojet jato standby unit.

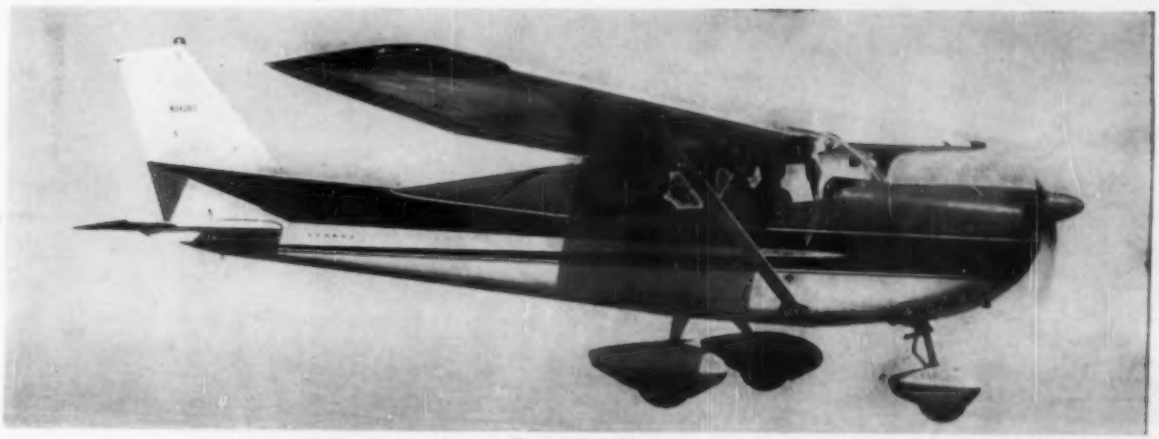
FLYING NEWSREEL

CESSNA MODELS FOR 1960

CESSNA'S line of single-engine, fixed-gear airplanes for 1960 has been given a new look, as well as increased performance and utility. All, with the exception of Models 150 and 180, feature the swept-back fin and rudders which besides looking modern increase directional stability. In addition, the 180 and the 182 are equipped with a new rear seat area bulkhead providing extra headroom for the rear passengers. The 182 and Skylane have increased visibility by virtue of larger rear seat windows and two additional side windows just aft of the rear passenger compartment. Complementing the four-place Model 175, powered by the 175-hp geared Continental, is the new, de luxe version called Skylark with a top speed of 149 mph. This plane is offered with a full instrument panel including artificial horizon and directional gyro, as well as landing and taxi lights, flasher beacon Fiberglas wheel fairings and tow bar. Electronic equipment is optional. A preview of the new models was held during Cessna's annual international sales meeting in Wichita, Kan., last October.

Cessna 172

Cessna 180

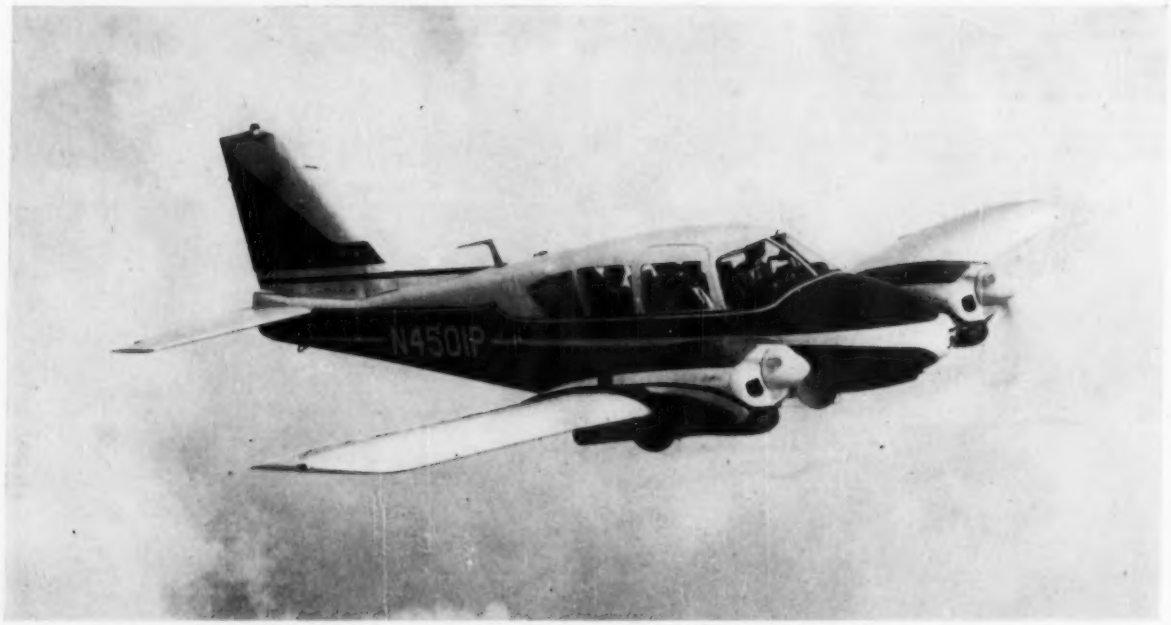


Cessna Skylark

Cessna 182

FLYING NEWSREEL

PIPER AZTEC, twin-engine, five-place airplane, that cruises at better than 200 mph, has been added to the line of Piper aircraft. The new plane was officially introduced during the annual Piper International Distributors Conference at Lockhaven, Pa., last October and will be available in December. While the airplane's origin stems from the popular Apache and uses many of its proven systems and components, the Aztec's outer appearance and cabin design are different. The airframe incorporates a completely new horizontal tail, similar to Comanche's "flying tail," with an anti-servo tab. This provides better elevator control at slow speeds and some 25 per cent less total surface than the conventional stabilizer-elevator configuration. The vertical fin and rudder are swept back, and give excellent directional stability in normal and single-engine flight. Rudder is equipped with a servo tab. Large cabin seats five comfortably and the rear, fifth, seat has two large windows on each side. All seats can be removed to convert the plane for cargo carrying. The Aztec is powered by two direct drive Lycoming engines rated at 250 hp each. Price for the Standard model is $49,500. Also available are the Super Custom with additional NAV/COM and Auto-Flight with Piper's Auto-Control system, priced $53,550 and $54,105 respectively.



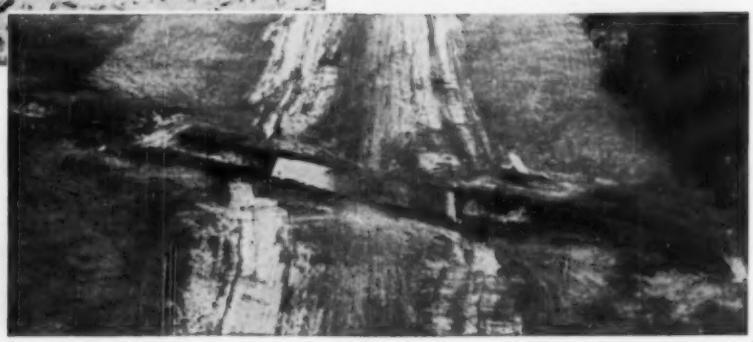
FLYING NEWSREEL

LASA 60, an all-metal utility plane designed and built by the Georgia Division of Lockheed Aircraft Corp., made its first flight on a rainy September day. The airplane was produced for the Lockheed-Azcarte S.A. of Mexico, a corporation organized in 1958 by Abelzardo Rodriguez, a former president of Mexico in partnership with the aeronautical pioneer, Gen. Juan Azcarte and other Mexican interests, who combined with Lockheed. The LASA 60 is not a lightplane but a rugged aircraft specially designed for bush operations. It has a wing span of 40 feet and is powered by a fuel injection Continental engine rated at 260 hp. The large spacious cabin can hold six persons or convert to carry cargo loaded through a big specially designed door. Of interest is the unusual main landing gear which has sharply angled tubular legs. Project manager of the LASA 60 was Al Mooney well known for his design of numerous airplanes including the famous Mooney Mite. Production version of the Lockheed bush plane will be built in Mexico as soon as the plant there is ready to go into operation.

FLYING NEWSREEL

GYRO PLANE. Right: Two-place autogiro developed by Avian Industries, Ltd. of Georgetown, Canada. Powered by a 180-hp Lycoming engine, turning a ducted pusher prop, it has all steel rotor system said to be virtually vibrationless. Prototype, shown here, has a mechanical jump-off feature, production craft will have a compressed air system which pre-rotates the blades to jump-off speed by exhausting air through jets at blade tips.

GIANT SIZE tires on five Piper Super Cruisers owned by Bradley Air Service, Ottawa, Canada, have solved the problems of landing in soft and rough terrain of the Arctic Islands located north of the tree line, where the ships have been operating. The large, low pressure doughnuts measure 35 inches in diameter and, considering weight and drag penalties, are about as large as it is practical to go. The tires were made specially for Bradley by Goodyear Tire & Rubber Co., Akron, Ohio, using molds from twin engine Lockheed Electra of the early 30s, but poured much thinner and lighter. Flanges have been added to the regular Piper hubs to accommodate the larger holes. For normal operation, they are inflated to 4 psi pressure. Landings with the super-tires have been made on wet, muddy ground which was almost impossible to walk on. The only trouble was caused by the tail wheel which had tendency to bog in. This was solved by maintaining speed on touchdown until reaching firm ground. Boulders and sharp rocks are no problem; after a hard season's use, there has been no appreciable wear showing.

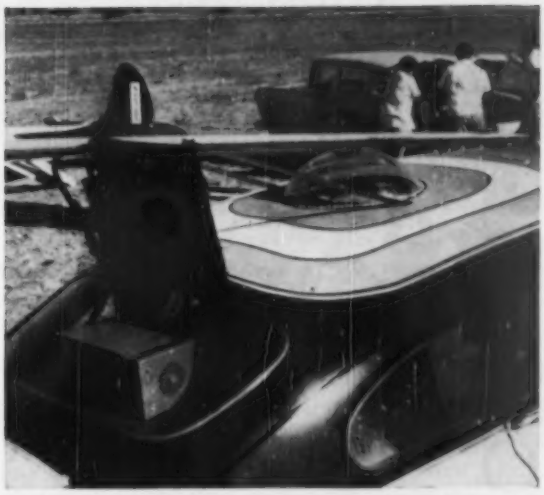


A BRIDGE across the runway can be disconcerting to a pilot on final approach, but a drainage ditch is downright dangerous. The bridged runway is located on Humble Airport near Houston, Texas, a 3,000-foot strip which started as a private landing field of Earl Bardwell and was only 1,500 feet long when purchased. The 20 foot ditch was then at the end of the runway. The strip attracted so many planes that Bardwell had to lengthen the runway, hence the bridge. Structure is strong enough to support light twins.

FLYING NEWSREEL

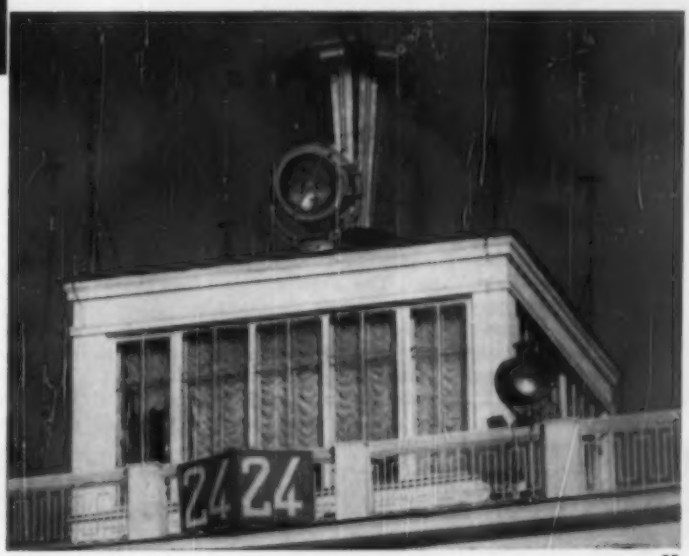
BIRD SHUTTERS. Right: Birds in California have a habit of getting into engine compartments and building nests. To keep the unwelcome visitors from the innards of his Cessna 140, George Jackson of Monrovia, made up a set of aluminum covers to fit plane's air intakes. Bright red handles, protruding over the engine cowling, prevent pilot from taking off with plates on.

JONAH AND THE WHALE. Above: While attending the 1958 National Business Aircraft Association convention at Philadelphia, Pa., pilot-photographer Tony Linck snapped photo of crewman about to be swallowed in the baggage compartment of a Beech D-18.



CAR WITH ASTRODOME. Above: Dorman Brown of Tulsa Skyhawks soaring club, Tulsa, Okla., had his car fitted with a plexiglas dome and radio to keep in contact with pilot for whom he crews.

EVIDENTLY not everything in Russia is shrouded in an iron curtain. Photo at right shows the Moscow Airport traffic control tower with fancy window curtains undoubtedly to keep sun from comrade controllers' eyes.



PICTURES, ANYONE?

If you have clear, interesting and unusual aviation pictures, previously unpublished, why not submit them to the Editor of FLYING, *One Park Ave., New York 16, N. Y., and earn $10 (maybe more) for each one accepted. Be sure to send complete caption information on a separate sheet of paper, and if you wish photos returned, include a stamped, return-addressed envelope.*

NO. 236

I learned about flying from that!

Although it was their first flight, even the passengers got in the act during this harrowing charter trip.

By JOSEPH M. GOLDEN, JR.

ONE DAY late in March a couple of years ago, I was hired as a charter pilot to fly two people to Sacramento from San Jose, Calif., and return with a third passenger from Sacramento. San Francisco Radio reported 1,300 feet and Sacramento reported 3,500 feet. The weather en route was fair with the exception of clouds over the Livermore Range. Satisfied, I took off and, after a smooth and unexciting trip to Sacramento, I picked up my third passenger and prepared for the return flight to my home base at San Jose.

The weather was to be the same as it had been on the trip up, so naturally I expected a smooth flight home. This pleased me as it was my passengers' first flight.

A front was moving through San Francisco, so I decided to return by way of Tracy and Gilroy and approach San Jose from the south instead of the north. Visibility was ten miles over the mountains. I could see the Santa Cruz range which was where I wanted to make my right turn to go up the Santa Clara Valley. The weather didn't look too bad and the passengers were enjoying the flight.

Then things began to happen. The clouds lowered and closed in on my right. I made a 180-degree turn to be ready either to fly back to Tracy or go south and get away from the mountains. After completing the first turn, the weather closed in on me on the left. Another 180-degree turn to get out before I became completely souped in, and the weather came in on my right again. I was completely engulfed in the clouds. To make things worse, it began to rain rather heavily. This worried me a little, but I did not show it to the passengers. The Cessna 172 was not equipped for instrument flying. The only two instruments I could fly by were the altimeter and the airspeed indicator. There was no "turn-and-bank" or "gyro horizon" to aid me. I had my radio tuned to the Oakland Omni, but reception was faint. I started to climb, not knowing of any high mountains, but in the event of motor failure, I wanted altitude so I would be able to glide a greater distance. The rain became heavier every minute. What with this and the clouds, I couldn't see my wing-tips.

My passengers were becoming a little concerned, but I assured them all was well, so they sat back relieved. Their reaction was normal since it was their first flight.

The gas situation was becoming a problem. The right tank was nearly empty and the left was about one-quarter full. As long as I could keep the ship flying, the gas was the only thing that bothered me.

I continued to climb for about 20 minutes. Some carburetor ice was beginning to form, but nothing serious at the moment. The climbing was difficult. I couldn't maintain an even air speed. Several times the plane almost stalled. Then it would get away from me and reach as fast as 120 mph. Once when the speed was 120, one of the passengers asked me if we were going down. I told him that I was just speeding up the engine to clear the ice, so that he would not worry. Even though this was not true, it kept the passengers from the truth, which I thought was the best thing to do at the present time. The woman passenger was taking things the worst. She began to cry and put her head in her friend's lap so that she would not be able to see the instruments, especially the gas gauge, which was registering near empty. The right tank was now on the empty line and the left tank was at one-quarter and also in the "No Take-off" section of the dial. With the fuel situation the way it was and since we were not breaking out (once or twice things had become bright but did not clear), I decided I had better put through a call I hoped I never would have to put on the air—*Mayday*. I put the first call to Oakland Omni. After several unanswered calls, I started to roam the dial for any station that would read me. Finally San Francisco tower acknowledged my call. I answered with *Mayday* and they cleared the air for my message. My transmitter was not functioning correctly, so I had great difficulty getting all of my message to the tower. San Francisco Radar called me on the tower frequency to ascertain my position. I advised that my position was unknown at 7,200 feet on an easterly heading. For some reason, probably the attempt to keep the ship in the air without any help from instruments, I was in a turn and thought I'd better leave well enough alone and continue turning as long as I kept in the air. Although almost frantic, I continued to climb and talk to San Francisco Radio, giving him my altitude when asked for the information. It seemed that the minutes were dragging by like hours. To make things worse, it was still raining and water was now coming through the bottom of the windshield and running down by the radio. Luckily, the water did not get into the radio so there was no harm done.

San Francisco Radar had now called me several times more and finally came back with the information that I was in three possible positions due to the fact that there were three different areas where the weather was bad. Radar then asked for my ship number and color for the Coast Guard's information. A few minutes went by and Radar came back on the air and told me that they were preparing to give me a radio fix to ascertain my present position. At least they would come looking for us if we went down.

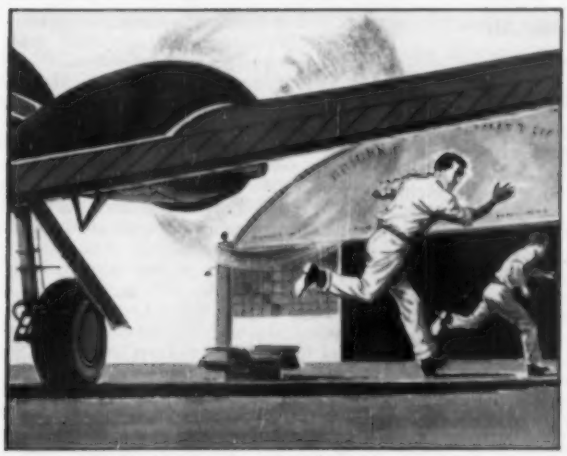
Just then the passenger sitting next to me pointed to the left front and asked if that (*Continued on page* 92)

ESSO

WING TIPS

DON'T CHANCE IT. Many a hot-shot pilot *thought* he could make it! You may think you know the area like the back of your hand, but don't chance it during hazardous weather. Minimum conditions for visual or instrument approaches and flight paths were set up for your safety – follow them!

AVOID "HEADACHES". Rough weather, grabbing brakes or any crash situation will cause injury of some sort if you're not strapped in securely. Check your seat belt and shoulder harness periodically for wear and anchorage security. Wear them and avoid "headaches"!



STAY "ON THE STICK". Failure to make corrections while taxiing has been the cause of countless groundloops and nose-up accidents. Be alert all the time – wind gusts, last-minute turns, overcorrections and near misses if not handled immediately can be costly. Remember, you're still flying 'til it's parked.

REMEMBER: For "Happy Flying"... look for the famous Esso Sign from Maine to Louisiana.

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ESSO STANDARD OIL COMPANY

Highways or Skyways..."ESSO RESEARCH works wonders with oil"

Business Flying Co-operative

(Continued from page 27)

individual as in the other categories. Any number of company personnel can use the plane as long as a qualified pilot does the flying. Sky Roamers will even supply a pilot at $5 an hour if desired. The member firm pays $65 in monthly fixed fees and $27.50 per flight hour.

The individual 310 shareholder—meaning he is the only one that can fly the plane as in the 172 and 182 classes—buys in at $3,000 for the stock plus $300 registration. Monthly fixed fee is $35 and flight hour charge the same as for the multi-use category.

Scheduling might appear to be a problem with 18 planes in demand by 160 members. Actually, there are only a few times when a stockholder can't get an airplane exactly when he wants it. A scheduling book is kept in the office—and it's first come, first served. Diversification of the members' occupations is the key to successful scheduling.

Long duration cross-country flights are usually reserved in advance and members fly frequently to the East Coast, Canada and major points in between. Some recent trips listed in the schedule book were to Albuquerque, N.M., Pennsylvania, New York, Salt Lake City, Utah, Phoenix, Ariz., Seattle, Wash., Idaho, Toronto, Canada and Michigan. Numerous short range trips are made throughout California, over to Las Vegas and other neighboring points.

Each plane logs about 700 hours a year, for over the break even point. Experts agree that a plane should fly a minimum of 600 hours for economical operation.

Pilots in the more advanced category with access to all the planes select the type they will use by the length and duration of the trip. For example, a 310 member will use the twin for trips of 300 miles or more, particularly if instrument or night flying is anticipated and will fly the 182 or 172 to shorter points such as San Diego and San Francisco.

Co-operative by-laws require that each member fly a minimum of 36 hours a year. If he does not, he is penalized. Whether he flies or not, a member must pay for 36 hours of flying each year or three hours per month. He is billed at the rate that represents gross cost of the airplane in the category for which he holds a stock share.

A similar penalty holds true for members taking planes out on extensive trips. If a plane is booked out for a week, the pilot must either fly two hours a day or pay for a minimum of ten hours flying time. This insures that active members don't have to carry inactive ones. The financial position of the co-operative is all important, both for buying new aircraft and depreciating current equipment.

Financing of new equipment has been carefully worked out and members as a group have access to financing methods which cannot be achieved by individuals.

"We have always followed the basic premise that we will borrow at times for financing of aircraft up to 50 per cent of the invested capital—the total worth of membership shares," Brown explained. "We will not borrow more than we can retire easily in 30 months out of reserves for depreciation."

Sky Roamers has grown to such fiscal reliability that they have acquired an open line of credit with the Bank of America, the first time the bank has worked out such arrangements with a a group of flyers.

The co-operative got its big toe wet in bank financing when it was able to secure a loan for its first Cessna 170 to 1949. For a few years thereafter, however, it relied on personal notes floated by individual members for financing new equipment. "We finally came to the point where we were borrowing more than we wanted to from members," Brown continued. "And we went back to the banks. We learned one lesson through this—once you start borrowing from a bank, keep it up. It took a while to re-establish credit after our initial effort."

Now, however, Sky Roamer's has obtained the open line of credit. It was granted by the Bank of America based on the balance sheet and financial statement, plus maintaining a specified balance in its commercial account.

The co-operative makes regular minimum monthly payments of simple interest on the unpaid balance, instead of the more costly discount interest. The arrangement is similar to that usually only granted to airlines and some very large corporations with fleets of business planes.

Depreciation is handled in the same big business way. The co-operative has established a depreciation fund—something an individual plane owner is usually hard pressed to do. Every time a member pays his hourly flight charge, he is contributing to the fund. The hourly rate covers cost of fuel—the most predictable figure; and maintenance cost per hour computed over the anticipated planned life of the airplane. The balance goes into depreciation.

For example, the $7.50 per hour charge for the Cessna 172 is broken down somewhat as follows:

Fuel after tax refunds	$2.75
Maintenance	2.50
Depreciation fund	2.25

Hence, if the 172 is kept in operation for three years and flies the expected 2,200 hours, the fund is built up to $4,900 for the particular aircraft which can be deducted from the original value.

The co-operative's insurance program has undergone some significant changes this year also. Sky Roamers has always carried the maximum hull and liability insurance allowed. Because of its size, it is now rated on its own experience rather than from national averages. This year, it has set up a self-insurance program. The board of directors voted to switch from $500 deductible on hull to $2,000. The savings in premiums are placed in the self-insurance account to take care of any emergencies. Thus each airplane, regardless of value, has coverage benefits up to $2,000; the insurance company does not have to be bothered with small damage claims, preserving the co-operatives, good record; and Sky Roamers can do its own repair work in its own shops at less cost.

Sky Roamers began doing its own maintenance about four years ago, maintaining its own shop adjacent to the facilities of Pacific Airmotive at the Burbank field and employing a full time supervisor and assistant. Presently, it has the services of a PAC technician full-time under contract and draws on additional PAC knowhow as needed.

"It was important for us to have our own shop," Brown stated. "We run a very tight turnaround operation impossible to maintain without controlling our own maintenance operations. Also our shop is geared to our type of operation with commensurate low overhead."

Such financial capabilities and maintenance services are what has given the co-operative its great impetus. Members have the flexibility and investment protection of owning his own airplane plus the kind of service only available as a rule to a corporate fleet type operation.

Brown and the full membership are convinced that the co-operative is the answer for any businessman-pilot who flies for business at least 35 hours a year but less than 300.

If he flies under 35, charter is the most economical answer. If he flies over 300, self-ownership may not be the most economical, but it is the most satisfactory since a co-operative is not geared to this level. The top number of hours flown by a Sky Roamers member is 200. However, the addition of the twins plus the new multi-use category will create a different situation.

The 310, Brown pointed out, is used for longer trips. It is equipped for instrument and night flying. Just the fact that it is more expensive will mean members will spend less time on the ground.

As the co-operative has grown each

(Continued on page 60)

NEXT MONTH IN FLYING

★

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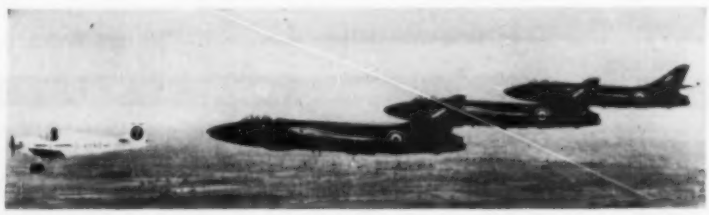
FLAPPING CRAFT A dream of man, long before Lilienthal, to copy bird's flight, is again being tested for reality. Shown above is a prototype ornithopter aircraft designed and built by the 39-year-old British sculptor, Emil Hartman of London. Flapping motion is achieved by means of foot pedals and hand grips which are used as oars.

ALOUETTE TO THE COAST When Coast Rotors of San Diego, Calif., purchased two turbine-powered Alouette helicopters from Republic Aviation Corp., Fred Lemke, right, Coast Rotors flight operations director, accepted the craft from Republic's general manager, Bill Littlefield, left, at Farmingdale, N. Y. Then he and another pilot ferried them west.

HARE AND HOUNDS Don't look now but someone is following you. A Turbulent lightplane, flying over the English countryside is about to be overtaken by RAF's Hawker Hunters. This may get turbulent for the Turbulent.



(Continued from page 58)

year, so has its special services to members. In the past couple of years it has been able to employ full time help. The professional staff, headed by C. A. Malone, now performs special services for the co-operative under contract with the new Air Service. Thus, the co-operative has access to top flight instructors.

Each new member must be thoroughly checked out in the airplane he is to fly. As he advances in equipment, Sky Roamer instructors provide the transition training. About 25 per cent of the members have taken advantage of the instrument flight course provided under special arrangement with an adjacent flight school for preferential rates.

According to his rating, each new member takes a check ride for local and extended cross-country; local and cross-country night flying; and instrument flying. After the check, he is issued a card indicating his qualifications and privileges. If a member hasn't flown in 90 days, he must be rechecked. All members must have an annual check ride.

Sky Roamer's training activity totaled a whopping 2,100 hours in 1958 alone in checkouts, flight training, and new ratings. During the year, members earned 24 private licenses, five commercial tickets, 13 instrument ratings, seven multi-engine ratings and three instructor approvals.

Like co-operatives in other fields, Sky Roamers is self-governing. Annually the memberships elects a board of directors who in turn elect the three officers. The presidency is held by Brown, who is the assistant chief industrial accountant for Lockheed's California division. The vice president is Wolfgang Reitherman, a director for Walt Disney's Studios. Secretary-Treasurer is James M. Dunlap treasurer of the Triple A Neon Sign Company. Other members of the nine-man board include: William Hosmer of Ryan Aeronautical, Matt Jacobson of Jay Craft, Leo Partridge of Douglas Aircraft Co., Bill Irvin, an attorney; Burt Turney, a commercial photographer; and Fred Guyon, partner in a trailer sales agency.

END

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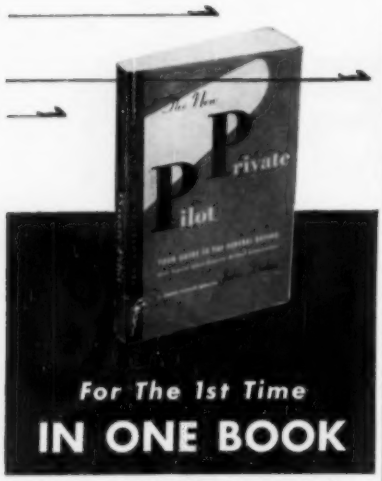

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HANGAR FLYING

CHECK YOUR BELTS

DURING the late part of August 1957, I was anxiously killing time around the airport at Washington, N. C., where I work, waiting for the weather to clear up a little more so that I could fly over to Rocky Mount and take a check ride for my Private Pilot's license. The weather had forced me to postpone several appointments during the past week and, needless to say, I was hoping that today it would permit me to prove my skill in the air and perhaps I would return home a rated pilot. The visibility was excellent, ten miles at least, but the ceiling still uncertain. I finally decided it was alright and called Mr. Harmon in Rocky Mount and asked him if he would give me a check ride if I came over. He was not sure about the weather, there was quite a bit of low cumulus hanging around and he told me to come on over anytime when the visibility was three miles and the ceiling at least 3,000 feet. The latter requirement was the only one that I had to worry about. Instead of sitting around and waiting, or calling the weather station, I decided to take the airplane and find out for myself how high the ceiling was.

I walked down to the taxi strip to the Piper Cruiser, which was lent to me by a friend, and removed the tiedowns. After running a "lick-and-a-promise" type of inspection, I released the front seat belt from the stick which kept the elevators from flapping, and climbed in. The engine started immediately and ran smoothly. It seemed ready to go so I eased the Cruiser out on the concrete and taxied to the check out position at the end of the runway. Everything seemed in order and I decided to sit there for a moment and let the engine warm up. Then I kicked the tail around into position and opened the throttle.

With the same thrilling sensation of taking off which I always experienced, I felt all of the 100 horses go to work. But in the next instant the thrill changed to a cold chill as the stick would not go forward and the plane felt terribly tail heavy. But I was not about to cut power as, in that short moment, the healthy Lycoming had the plane climbing at an amazingly steep angle. "The trim tab," I thought, "How stupid." I cranked it all the way forward, with no results. The stick was all the way back and would not budge. Twisting my elbow between the stomach and the stick I tried vainly to force it forward.

While all this was happening the plane assumed an angle suitable only to a VTOL and the air speed indicator was pointing a sharp hand at 50 mph which is normally the Cruiser's stalling speed. As the plane has not stalled out yet, I decided, without further ado, to put my slow flight practice to work. The altimeter read a bare 100 feet and spinning in was a real possibility. Chopping the throttle and muttering a silent prayer, I kicked full right rudder almost denting the firewall with the pedal. The left wing was already on way down but miraculously under the influence of right rudder it began to rise slowly. The plane was settling in tail low attitude and, just about the time the wings levelled, I opened the throttle smoothly and touched down gently on the runway. I taxied to the ramp, cut the engine, hopped out and started toward the tail to see what was wrong with the elevators, but stopped short behind the lift strut and stood staring. The rear seat belt was lashed around the rear stick! Since that day I have formed a strict habit of checking the controls for complete freedom of movement. At least six people saw the near-accident and everyone agreed that I must have had a great co-pilot.

BRYAN SULLIVAN

Raleigh, N. C.

SQUALL LINE

A YEAR ago I was returning from Canada, via New York from a coast to coast flight to my home in Los Angeles, in our company's TriPacer. The trip was a combination of business and pleasure and I managed to do some moose hunting while in Canada.

On leaving Dallas, Tex., I figured on making El Paso before dark as the weather seemed to be fine, the forecast indicating hardly anything to be worried about. While landing in Midland for gas, another weather check was made and this time there was some doubt as to what the conditions were farther west. The station at Wink was not in operation at that time and I settled to a monotonous trip from Midland to El Paso, paying close attention to checkpoints as this country is somewhat desolate.

Everything went along in a normal way and approximately 30 miles from Guadalupe Peak I switched on my radio to pick up the Salt Flat station without realizing that it was out of the line of sight range of my omni. Luckily I left the receiver on, as several minutes later a loud clear voice announced that a squall line was approaching El Paso. The sky was full of transmissions and I had to wait a few minutes, before the air cleared, to contact Salt Flat. The station was giving instructions to other aircraft and I got a briefing on what was going on. I was not quite sure of my position and as I crossed the ridge the squall line over El Paso stood out clearly on the horizon. When I was able to establish communications, I told them that I did not know exactly, but estimated to be somewhere east of them and near a highway. As the operator came through with the exact location of the airport, I asked him whether it would be better for me to go to Van Horn. He replied that winds were much higher there and I had better land at Salt Flat.

(Continued on page 66)

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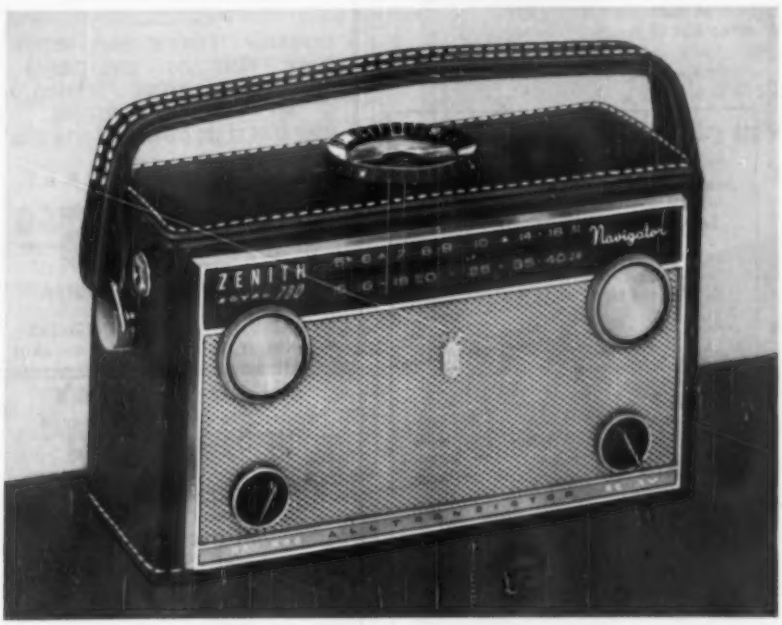

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Hangar Flying

(Continued from page 64)

By then the rain was hitting my windshield but with their help I decided to fly down the highway and land at the Salt Flat emergency field. Not realizing how close I was to the airport, I flew parallel to the highway, reading off the signs while the excellent operator was telling me how far this was from the station. I will have to admit that I made too fast a landing from a straight-in approach when the airport loomed directly in front of me, but with only about five minutes to spare, we were able to tie down the TriPacer before the squall hit. It will be many winters before I forget the feeling of warm fellowship to the men in the station at Salt Flat, Tex., when the squall came out of nowhere.

RAY M. MITCHELL
Hollywood, Calif.

FLYING CALENDAR

Jan. 1, 1960—Pancho Barnes Airport opening, Gypsy Springs Ranch (L.A. Sectional), Calif. RON and the works.

Jan. 14-16—Tenth annual convention of Agricultural Aircraft Association at the El Mirador Hotel, Palm Springs, Calif.

Jan. 18-21—American Astronautical Society sixth annual meeting at Statler Hilton Hotel, New York, N. Y.

Jan. 23-31—Flying Farmer Flight to Mexico starting at Monterrey and ending at Tampico. For information: write Kenneth C. Butler, Hutchinson, Minn., or NFFA Hq., Municipal Airport, Witchita, Kan.

Jan. 25-28—Institute of Aeronautical Sciences 28th annual meeting at Hotel Astor, New York, N. Y. Honors night dinner Jan. 26.

Jan. 30—Annual Winter Carnival Fly-in at Holman Field, St. Paul, Minn. St. Paul Jaycee Aviation Comm. will be host to Minn. Flying Farmers. Pancake breakfast. Bring your own tie-downs. Contact: Jerry Brown, 2280 N. Hamline Ave., St. Paul.

Feb. 27—Antique Airplane Association first annual dinner dance at the Hotel Edison, New York City.

March 1-11, 1960—Third annual Flight to Mexico sponsored by Florida Aero Club. Starting vicinity of San Antonio (probably dude Ranch), Monterrey, Guadalajara, Mexico City, Acapulco, return to Brownsville, Tex. Contact: Harry B. Collins, Air Cruise Director, 375 N.E. 154th St., North Miami Beach 62, Fla.

May 1-4—Annual meetings and news conferences, Aviation Writers Association, Ambassador Hotel, Los Angeles, Calif.

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Grounded at Sixty?

(Continued from page 39)

out. Admitting that it is not harder but perhaps easier in some respects to fly a jet than a piston-powered aircraft, the FAA medicos say it requires a different set of reflexes. Though mental power may develop with age, new ideas may be absorbed less quickly, especially when immediate coordinated action must follow.

For the scheduled airlines, the Air Transport Association concurs with the 60-age limit, saying that any cut-off year is arbitrary and this may as well be it. ATA opposes the 55-age limit for jet check-out.

Some doctors agree with FAA, notably the designated flight surgeons. Some others oppose. One doctor branded the proposed regulation as "not only unjust but downright stupid."

The Air Line Pilots Association has been most outspoken in blasting the whole idea. Supermen are not required to fly modern planes. But the stiffening requirements of transport flight have washed out the unfit along the way, in ALPA's opinion.

The poorly qualified do not even start. United Air Lines has accepted only one out of 24 applicants for flight training.

Medical check-ups are exacting. Though FAA claims that conditions that lead to "sudden incapacity" often are undetectable, ALPA contends that electro-cardiograms screen out men with initial heart attacks.

Mortality in such cases is three to 15 times the average. With these men grounded, the active pilots should have more than average expectancy.

An extensive ALPA survey indicates that incapacity in flight most often is for temporary reasons, such as food poisoning, regardless of age. Furthermore, most pilots stop flying long before they are 60; 89 per cent of separations are under 40.

Elder railroad engineers, it is pointed out, drive highspeed trains. (Of course, a "dead man's throttle" cuts off the power if the man's grip relaxes, which would not be quite the thing for an aircraft.)

Of 87 aircraft accidents from 1946 through 1958, according to ALPA, 27 are attributed to the commanding pilot and the oldest was 50. Early in 1959, an airliner crashed at LaGuardia with a captain in his 60s at the controls. But his age was not found to have any bearing.

Most other civil aviation groups approach the problem by saying they are not directly concerned in the proposed changes. FAA denies any intent to apply an age limit to anyone but airline pilots, since public service is involved here.

But air taxi operators do common carriage also. FAA is busy tightening their regulations for this reason. If precedents are set, who knows whether corporation jet plane pilots will be next; then all transport plane pilots; then all pilots?

The National Aviation Trades Association questions that age makes people accident-prone per se. Young drivers and pilots tend to be more dangerous.

The National Business Aircraft Assn.

(Continued on page 69)

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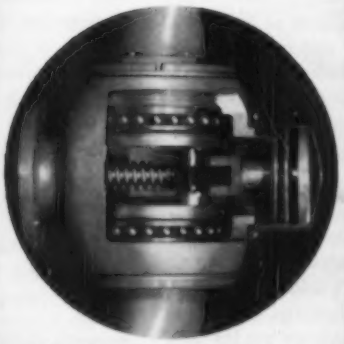

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(Continued from page 67)

says that knowledge of geriatrics—the study of the aging process—is limited. Present medical knowledge, NBAA urges, should be reviewed in a public hearing. There is some dissatisfaction in business flying circles with the FAA policy of having comments buried in the docket room rather than aired in public.

The Aircraft Owners & Pilots Association also is strong for a hearing. AOPA points out that life expectancy has increased in a century from 41.5 years to 68.3 years. At 60, an American male has a further expectancy of 16.2 years, so is he old yet?

Helicopter operators do not feel the limit should apply to them because the reaction time required in 'copter pilotage is even less exacting than for the old DC-3. CAB has suggested that they be eliminated by using the word "airplane" in the regulation, rather than "aircraft."

So much for the arguments on both sides. Quite possibly FAA will wait for more data. The official comment of the Civil Aeronautics Board refers to a study of 132 airline accidents from 1951 through 1958 as an "excellent starting point for further study" and offers to help FAA.

Unless FAA's Administrator Quesada is unusually insensitive to what other people are thinking, he may take this as a broad hint, if not a nudge, to withhold action till more facts are available.

The problem of age has been discussed for years in meetings of the Aerospace Medical Association (formerly Aero Medical) among others, as concerns aircraft control personnel as well as pilots, to no conclusion.

The Flight Safety Foundation has kept open-minded. The closely related Cornell Guggenheim Aviation Safety Center has concluded that aging does have some effect and something should be done.

If this is true for airline pilots, it is true for business flying as well. In the case of maximum pilot hours, mandatory for airlines, FAA has left business pilots and plane owners to their own discretion. The same will apply to pilot age, for some time at least.

Officials most interested in business flying say that no age problems have been observed in this field. Companies have not set maximum age limits for pilots. But a few have mandatory retirement for all personnel at 60 to 65 and pilots are included with the others.

Corporation pilots may be taken from flying status and shifted to other jobs, which are many in big companies, while airlines have comparatively few ground spots for aging pilots. Since many of the corporation pilots will be getting along in years, just as the airline age curve is shooting upward, it is timely to think of retirement plans.

The question of an arbitrary retirement age is still moot. Some safety experts think that more attention to pilot checkout and refinements in medical exams will be enough at this time.

This seems reasonable to the writer who does not pretend to be an expert but still likes to see things proved. END

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The Revolution in Air Cargo

(Continued from page 25)

to-load, prop-driven freighters.

Anyone who has ever written an overseas air mail letter—in which the weight of a single sheet of tissue can be critical—may well wonder why any shipper in his right mind would send heavy machinery, aircraft engines, automobiles and office equipment, or even furs, shoes, imitation jewelry and flowers by air freight. The simple answer, of course, is speed—air cargo is the hottest cargo. It sometimes gets to its destination weeks before surface shipments do.

But speed gives birth to other big advantages—lower packaging costs, smaller investment in inventory, lower labor costs, and less insurance. In other words, speed is money.

That's why Pan Am was given the nod to haul a 65-ton cotton gin (in eight shipments) from New Orleans to San Jose, Costa Rica, last year. The gin was needed *now* and it would have taken weeks to make the journey by ship and truck.

Last year, International Business Machines Corp. sent a Model 704 electronic data processor from Poughkeepsie, N. Y., to Paris. Capable of translating a French book into English or calculating the trajectory of a missile, the electronic brain is delicate, easily damaged if jostled. If sent by ship, crating costs would have been high. But for air shipment, IBM merely bolted it to a wooden platform and covered it with plastic sheeting.

Sometimes manufacturers can cut handling costs simply by dovetailing their production with an airline's schedule. Last year, American Optical Company traffic managers and Flying Tiger Line salesmen took a hard look at American Optical's packaging, shipping, and storage program and made minor changes that cut manpower costs 25 per cent in California alone. Resultant savings totalled $250,000 the first year, a potent argument for using air freight.

During the recent recession, many buyers who could not afford to build their inventories to comfortable levels used air freight to bail them out when they needed goods in a hurry, and were surprised to find that lower packaging and inventory costs rewarded them with a return of $2 for each $1 spent. Thus, ton by ton, the air cargo carriers have been winning new customers.

The surprising thing about air freight is that it creates its own business. For example, take a look at the ingenious way that Paper-Mate Pens, now owned by Gillette of Chicago, is using air freight. Pen parts are made in Chicago and California, sent to New York International Airport, then flown 1,602 miles to San Juan, P. R. They are assembled by hand, then shipped back in containers, complete to sales display cartons. Speed is so great that pens are sometimes on sale in New York City the very next day.

Because of these inherent advantages for shippers, air cargo has skyrocketed since World War II. And now that it has proved itself, the government is moving to put it on a solid foundation for the tremendous push into tomorrow.

The Military Air Transport Service, which competes with the cargo carriers in certain ways, is expected to cut utilization of its planes to five hours per day starting this year. This will give MATS enough time in the air to maintain an adequate airlift for an emergency but will divert $100,000,000 in revenue to the commercial carriers.

And the U. S. Post Office plans to become a big air freight customer. As you know, about 25,000 tons of first class mail have been traveling by air on a space-available basis between certain U. S. cities for the past several months. The experiment has worked out so well that the Post Office wants to increase the tonnage to 175,000 tons. If the new plan goes through, the cargo carriers will take in an additional $20,000,000 a year.

And so the airlines, eyeing these new straws in the wind and watching the fantastic growth of our economy, have gone on a wild conversion program. American has put $4,250,000 on the line to make freighters out of its jet-displaced DC-7s. The conversions, dubbed DC-7Fs, cruise 300 mph, have a usable cargo space of 5,253 cubic feet and lift 33,500 pounds.

Pan Am has ordered ten of the same conversions and United has ordered six. TWA is transferring six Super H Connies and a couple of O49 Connies from MATS runs to commercial all-cargo runs. U. S. cargo carriers are ready to blast off.

What's the secret of their confidence? First, as we've seen, they know the market is there. And they know it's growing. But more important, they have for the first time in history a turbine-powered plane that was specifically designed for easy loading and fast hauling of cargo. Ex-fighter pilot Bob Prescott of Flying Tiger Line led the way last spring when he laid out $55,000,000 for ten of the revolutionary Canadair CL-44D swing-tail turboprop cargo planes. Seaboard & Western took the plunge at about the same time, ordering five of the 400-mph giants and taking an option on five more. It was then that the airlines lit the fuse that will lead to the real "explosion" in air cargo.

The new CL-44D is 136.5 feet long and has a cubic capacity of 7,391 feet. It grosses 205,000 pounds and carries a payload of 73,000 pounds. That's a lot of airplane and a lot of cargo, but it only hints at the plane's unique advantages.

Loading 73,000 pounds of mail and freight would take about four to five hours if the handlers had to "rassle" it through the side door of an ordinary cargo plane. But the CL-44D is no ordinary cargo plane—the fuselage breaks in two just forward of the tail and the tail section rolls aside to expose a long straight-in "tunnel" for easy loading. Canadair has stuffed one of its swing-tail jobs in 19 minutes by the watch.

And the CL-44D is much less expensive to operate than prop-driven planes. The four Rolls-Royce Tyne engines burn kerosene instead of 130 octane gas, saving the operator eight cents per gallon—a substantial amount when you consider they gobble up 800 gph. The powerplant itself weighs about half as much as a piston engine, saving almost six tons that can

(Continued on page 72)

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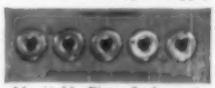

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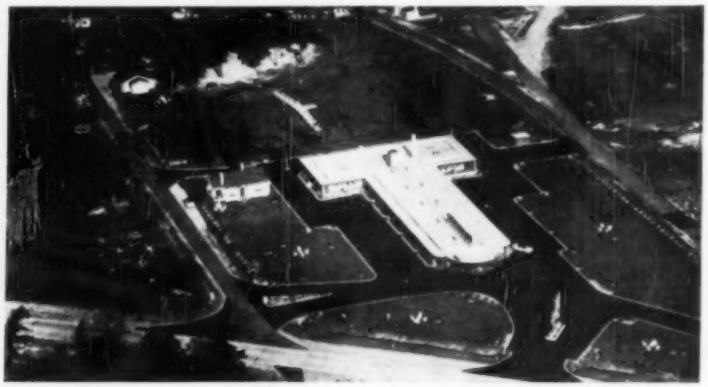


OVERNIGHT STOP—NO. 56
Moseley's Shady Lake Motel
Rocky Mt., N. C.

AT THE TOP of North Carolina, some 40 miles below the Virginia border, Rocky Mount Municipal Airport is conveniently situated on a direct North-South course. Just a mile from the airport toward the city is Moseley's, an AAA-approved motel which offers, in addition to first-class accommodations, some good lake fishing, swimming and an area for picnicking, in season. A motel courtesy car takes care of your ground transportation.

Adjacent to Moseley's is the Rio Restaurant noted for good food, member Diners' Club; also a Howard Johnson restaurant.

Motel rates range from $5 to $6, single; $7 to $8, double; $8, $9, $10 for family rooms. For reservations, call Rocky Mount 67195.

The airport 2.3 mi. N. (class 3) on Norfolk (Va.) chart has two paved runways: SSE 4,000 ft., NNE 3,800 ft. Administration building with snack bar and free coffee. Runway lighting, rotating beacon; major and minor repairs; hangars and tie-down; gas, 80/91/100/130. Also radio facilities, Omni, communications station, teletype, weather (FAA). Rental cars, taxi. Served by Capital Airlines.

(Continued from page 71)

be converted into payload.

Other factors which help cut flying costs are less frontal area of the power plant, less power loss from friction, and considerably lower maintenance cost.

The CL-44Ds go into service next year. In a few years after that, chemists should have come up with additives that could double the output of turbine engine fuels. "Here's what that will mean to us," says Prescott. "A CL-44D takes off for Los Angeles from New York with 50,000 pounds of fuel and 70,000 pounds of payload. With the new fuel, it would take off with 25,000 pounds of fuel and 105,000 pounds of payload. When that happens, and it's bound to happen, the day of the long-haul truck will be a thing of the past." It is on the basis of the dramatic performance of the CL-44D that Prescott has filed the new tariff under which he will move freight at 13 cents per pound, at 400 mph.

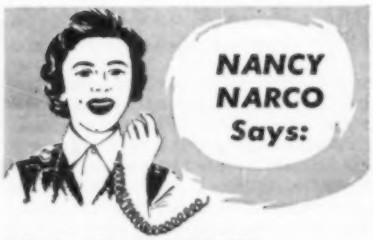
Where do we go from here?

"By 1965," says Prescott, "we expect the industry to be doing seven to ten *billion* ton/miles. If you think we are over-optimistic, you must realize that we would still account for less than one per cent of the total transportation picture."

"Within ten years," says Earl Johnson, executive VP of General Dynamics, "all the airlines will probably be doing more cargo business than passenger business." By 1975, over 1,000 new cargo planes will be needed to air-lift goods to ports around the world.

Stand back. Air cargo is about to "explode."

END



CAN'T GET THE TOWER?

Things get a little sticky, both for you and the tower, if you can't make contact after the first two or three tries. You're probably rapidly nearing the pattern with out clearance, or you're milling around 10 miles out, cussing the tower and your radio. The tower man (poor guy, it's illegal for him to cuss) probably hears you loud and clear and is using up a lot of air time giving you the long count. There are several good reasons why people have trouble receiving the tower:

1. *Wrong number.* Tower frequencies *do* change and these changes don't show up on old WAC or Sectional charts. If you're doing any extensive cross-country flying, radio facility charts (Jepp or Coast and Geodetic) are pretty much a must.

2. *Improper Tuning.* If your receiver is a tunable one without benefit of "whistle stop" or crystal-controlled tuning, allow for discrepancies in your tuning dial. When you call a tower, have your hand on the tuning crank and rock it back and forth, bracketing the approximate position on the dial where you should be getting the tower. This is especially true if you're in a strange airplane with a receiver you're not familiar with. Some of them can get five-tenths of a megacycle off calibration. So don't just rock the needle back and forth one or two tenths to each side of where you think the tower should be. "Scan" a good area.

3. *Kilter Factor.* Maybe you've done things right, but things in the cockpit are out-of-kilter. You've forgotten to turn your volume up or the audio switch on. Perhaps you've inadvertently hit the tuning knob and knocked it off frequency. Or maybe you haven't switched your transmitter to tower frequency!

Probably the best advice is "sooner tuning." Start tuning 20 or 30 miles out, and make your first transmission at least 10 miles out. Even before that, figure out the tower frequency, be "mentally prepared." If there's some question on the numbers, you can always call the nearest FAA station and they can give you the proper frequency.

And, speaking of "numbers," you can save the tower a lot of repetition by following a procedure which is just coming into usage. If you already have the tower tuned before your first call-up and hear the tower giving other airplanes runway number, wind, altimeter, etc., just tell the man after he acknowledges your first transmission, "I have your numbers." That means you have all the pertinent landing information, no need for him to go through the same song and dance.

Regards,

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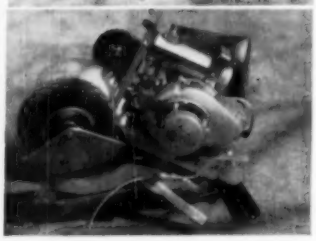

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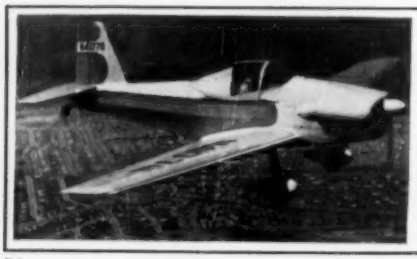

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Make Mine Skis

(Continued from page 41)

very minimum for the first few feet that you are in the air. The speed of the aircraft is very low at this point and, if you overcontrol, a stall will result. The aircraft catches up on itself fast and as long as the pilot is aware of what takes place, there is no cause for alarm. If the plane appears to be unwilling to take to the air when the attempt is made, there will often be a drop in airspeed; don't attempt to force it but assume the *ideal angle* again, allowing the speed to build up, then try again. This is part of the standard technique used by skilled ski pilots and is one of the finer points to learn.

I haven't elaborated on the use of ailerons during take-offs, simply because there is little difference in this technique between wheels and ski-equipped aircraft in a crosswind. Use what aileron is necessary, remembering that a wing may often be low when the aircraft starts to fly because of rutted snow drifts, etc.

Another take-off problem that arises is the one brought about by drifting snow. Often these drifts are seemingly hard as granite. A take-off in this kind of surface conditions must be carefully thought out, taking into consideration wind direction and velocity, as well as the average direction and size of drifts. If they're close together and the skis will straddle them, there's no problem; if not, you've got a rough ride ahead when taking off across or perpendicular to them; more likely you'll damage the aircraft too. A good rule of thumb is to ask yourself: "how high, how hard, and how far apart?" When the answer tends to indicate that a take-off is possible, try a fast taxi across them first. Do this in the actual area that you intend using. The drifted snow may be higher in another area. Watch the turns in drifted snow and avoid any sideward sliding of skis. Speed complements sliding and, if you hit a drift at the right angle, it may wipe out the gear. Summing up, always make your take-off in drifted snow conditions parallel to the drifts, provided the wind and the terrain permit it.

So much for the take-off phases. How about those easy and wonderful landings? They can be rough under certain weather and surface conditions. Generally, you set up a glide the same as in any other type of landing, level off, and three-point the aircraft, keeping straight with slightly more use of rudder than its wheeled counterpart; however, the foregoing is under good conditions, so let's throw some problems into the situation. Having the advantage of being airborne, you have the ability to look around for a potential landing area at your leisure. We will call this phase *landing area evaluation*. We're assuming that this is an area which you are not familiar with, such as a distant lake. In our evaluation we can find the direction of the wind by blowing snow, nearby smoke and other methods, remembering that blow snow usually parallels the main drifts. This is to your advantage because on overcast days, the drifts cannot be seen. The sun plays an important

role in landing area evaluation as drifted snow casts shadows and they are particularly noticeable in the early morning and late afternoon hours.

There is a weather-land phenomena called "whiteout" which you should know something about. Imagine yourself in an immense white bowl of milk and you'll get a pretty good idea of what it looks like. There appears to be no up and no down, and one is particularly susceptible to vertigo under these conditions. Whiteout exists when the sky is solidly overcast, the sun is hidden, and the snow-covered terrain is completely white and unbroken by reference marks, such as trees, rocks, roads, etc. It is found generally in the barren and wilderness areas of the far north. You as a beginner may be faced with a smattering of it, however, while landing on a large lake or open field away from reference points on the shore line. When this happens, attempt to keep your landing close to the shore, commensurate with safety, of course. There are times when this is not possible though; then you're confronted with a landing in whiteout conditions.

We'll assume that you have found the direction of the wind and mentally planned your pattern; flown it accordingly, and are on the final approach. Now comes the difficulty, *you can't see how high you are.* It's like having to let down a deep well on a rope at midnight and wondering when you are going to hit the water! Take my word for it, it can be dangerous but only if you let it be so. If the condition is extreme and you are not a qualified instrument pilot, plus an experienced ski pilot, get out of there and fast. Even for a professional, it is a calculated risk if he is landing on an unproven area. If, however, you are mixing common sense with experience and the condition isn't too severe, here is the technique that makes it possible.

Using about 300 to 400 feet as pattern altitude, and assuring yourself adequate visual references to guarantee this altitude above terrain, set up a power-on final approach at 110 per cent of stalling speed, utilizing no more power than necessary, but enough to keep the nose somewhat high. If you have a rate-of-descent indicator in the aircraft, keep the descent at about 200 fpm—no more! If you lack this equipment, merely set up what appears to be an extremely slow rate of descent. It's actually slower than you would imagine. What you are trying to do is cross the last reference point, the edge of the landing area (more often than not tall trees) at a sufficient altitude with the aircraft all set up in gliding speed, rate of descent, and attitude. Make only minute adjustments to the power and the angle of the nose; allow the aircraft to continue to the surface in this manner, instantly cutting the power after touchdown. The landing is like the kiss of an angel. Sound difficult? It isn't. It does take a little practice beforehand but after that you'll find it fairly easy.

To take off into this sort of condition, find yourself first a reference point on the shoreline or edge of your take-off area and use it for direction *and height*, keep-

(Continued on page 76)

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(Continued from page 75)

ing the point in sight at all times; once off the snow, never level off until you cross your reference point (it's hard to tell your angle of climb unless you keep that very vital reference slightly down and under the nose); don't attempt a turn until you have crossed the edge of your take-off area.

Landings can be made in snow considerably deeper than that in which take-off can be accomplished. When you arrive over a site and find that your landing area evaluation tends to indicate deep snow (a good method in determining this is to look for large drifts against buildings, use of snow shoes, snow plows, etc.), set up the pattern and gingerly make a power-on approach, allowing the skis to impress themselves slightly into the snow. Make this impression through the snow for a considerable length, depending upon the type of aircraft and the normal distance required for its take-off. Don't allow the speed to drop too low, or the tail to settle, the latter being indicative that your speed is getting too slow; conversely, be sure that the nose is kept slightly above the horizon. In essence, the attitude is *identically* the same as for take-offs in deep snow. After making several of these running passes over the same track, you'll have prepared a suitable runway for a successful landing and take-off. After you decide that you are finally ready to land, set the aircraft down in a full stall at the head of the tracks, allowing the skis to stop in the ruts. The remainder of the track can be used for take-off when you get ready to leave. There is, of course, another technique by proceeding out of the track immediately after landing, keeping the aircraft moving as fast as possible so it won't bog down, executing a 180-degree turn, holding it straight momentarily, then making another 180-degree turn. This procedure puts you in the exact first few feet of the track that you have formerly prepared. The latter technique is most useful when the landing area is limited in size; however, with this technique you are taking a chance in getting stuck and overheating your engine. Either of the two possibilities can be a little rough.

In an emergency landing, a wheel plane is generally at a disadvantage frequently coming to a stop on its nose or its back; not so the ski-plane, since the pilot can usually negotiate a safe landing anywhere, on snow or dry land. What is even more interesting, the ski-plane will land also on water. A skilled pilot can make a water landing using the "boards" as hydro skis, and by maintaining speed successfully beach the aircraft without wetting his feet. I have watched several well-known bush pilots who operate from mud flats on skis, take off and fly to an unfrozen body of water, wash the skis off and then land on snow-covered surface.

There is no doubt that skis have a great number of advantages and the fact that most aircraft are easily converted to ski-wheel gear makes the proposition even more attractive. For instance, Federal Ski & Engineering Corp. of Minneapolis, Minn., manufactures a fine ski-wheel combination. Dry runways, snow-covered fields and frozen lakes are a cinch to a plane equipped with this type of gear since the skis can be raised or lowered while in flight or on the ground by means of hydraulic controls in the cockpit.

Teaching yourself to be a good ski pilot is mostly a matter of trial and error. I personally find Roy Holdiman's axiom of "Ski flying is nothing but knowing where *not* to land" to be most applicable. There is no superhuman skill required. If you can become proficient at making accurate landing area evaluations, you've got it whipped. Since most pilots flying on skis do not operate out of an airport at all times, this is quite important.

Take it from me, having skis installed on your aircraft will open up a wonderful realm of winterland to you and offer a barrel of fun at the same time. So if you're fed up with the crowded summer resorts and you're looking for something new and different, look into the cost of a ski installation for your plane. END

Northrop

(Continued from page 43)

There must be something to hold them there. And we will come to that in good time, although I can think of nothing more superfluous in the story of the college than descriptions of its new engineering building, its drafting lofts and electronic laboratories and jet engine test stands. Adequate physical paraphernalia is not the simple requirement it was in the days of the three "Rs." Instruction in modern technology is a many sided business and the gadgetry of electronic systems, hydraulic operations and instrumentation makes for an expensive and imposing array of classroom equipment. Not only is it all there at Northrop in required quantity and quality but additionally I noted shelves of various company operating manuals outlining for the student the way Douglas or Lockheed or another does it. This was the first time I had ever observed such a feature. Its advantage is obvious. An Institute graduate going to work for a major aircraft company can find himself immediately at home with the procedures, policies and organization of his employer. The company saves untold outlay for indoctrination and the new employee begins his career with a distinct advantage in efficiency.

I must confess an admiration for the educational institutions of aviation which have a private enterprise heritage. Born as they usually have been out of the vocational demands of air industry and commerce, and often under relentless pressures in national crisis, they have contributed mightily to the international superiority of American civil aviation and to the defense of the free world.

I just do not know what we could have done without the hundreds of thousands of young men who for one reason or another have had to mature their airwise knowledge and skill at a pace quickened beyond the traditional.

While our system of free public education and our old established network of colleges and universities has been unable to develop curricular change in time to meet national security needs, Northrop and kindred schools, some of which, including Northrop, have transformed to degree-granting public colleges, held the line. Both the Government of the United States and the aircraft industry itself stand deeply in their debt. Their flexibility to anticipate vocational requirements and their intimate relationship with air and space science is one of their most notable attributes.

For example, as early autumn dusk began to shroud the campus, I noted 14 young men seated in line and peering intently into specially mounted telescopes, while at one side, six others hovered over a battery of recording instruments. Inquiry revealed that this is official satellite tracking station No. 142 (034-118), operated at Northrop by the student branch of the Pacific Rocket Society for the Smithsonian Astrophysical Observatory. The group has won an Observatory citation and is one of a half dozen selected to

(Continued on page 78)

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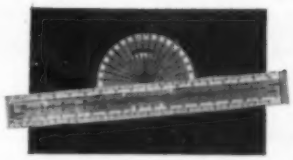

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(Continued from page 77)

participate in special alerts. This is project "Moonwatch."

"Three years ago such a thing didn't exist," remarked Prof. John Porter, faculty advisor to the Moonwatch team, past president of the Pacific Rocket Society, and currently vice president of the American Astronautical Federation. "Today there are numerous teams strategically located throughout the United States. Each is manned by a select crew of volunteers trained to spot and report time and celestial position of satellites passing through an "optical fence." This "fence" results from the precisely mounted battery of telescopes. Their overlapping fields of vision cover the entire span of the sky, from north to south, on a given meridian. No object can pass over without entering the field of at least two of the 'scopes. As observers call out sighting data, it is recorded on tape, with superimposed time signals radio-received from the United States Bureau of Standards, to establish when and where the satellite was seen through which instrument. Such information, from stations all over the country, is transmitted to the Smithsonian Observatory at Cambridge, Mass. There it is fed into an electronic computer, which pours out data on the satellite's exact orbit."

Now privately endowed and a nonprofit engineering college, Northrop Tech traces its beginning to early 1942, just six months after Pearl Harbor. Industry desperately needed trained technologists. John K. Northrop, the famed designer and James L. McKinley, distinguished technical educator, set up within the Northrop Aircraft Corporation, the "Northrop Aeronautical Institute." Their purpose, as Mr. Northrop expressed it, was "to compact a practical engineering education into two intensive years and teach young men what it took me ten years to learn."

The growth of Northrop Institute, like that of the industry which fathered it, was sensational. New buildings were erected and the school was opened to the public. A two-year technical institute course in Aeronautical Engineering Technology was offered and accredited by the Engineers' Council for Professional Development.

In 1953, the Institute's connection with Northrop Aircraft Inc. was severed. The school was moved to Inglewood and became an independent institution, with Mr. McKinley continuing as President and Mr. Northrop as Technical Advisor until his election as Chairman of the Board of Trustees.

From its inauguration, subject matter at Northrop has been presented at a high academic level and quality. The thesis of Northrop's technical philosophy has been from the beginning, "Designing for producibility." It is hammered into the student that any engineering project, from a washer to a complicated electronic control, must be developed into a form which can be produced with reasonable economy and speed; and must be clearly and completely presented in terms a shop can readily understand.

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ty" is a companion theme . . . safety. The Institute holds that education must have a "conscience" and that safety is a major factor in the conscience of air education.

Another intangible essential which an aviation school must have in marked degree is the ability to foresee scientific development and prepare for it. This is commonly called "vision". Back when jet engines were available only to the military and were almost impossible to obtain for educational purposes, the record shows that Northrop incorporated turbojets, pulse jets and ramjets into its program. Before the airlines placed their first orders for jet aircraft, Institute graduates were working for jet engine and airframe manufacturers; and before the first jets went into passenger service, airlines were using Northrop-trained men to prepare for the intricate and exacting maintenance problems which lie ahead.

Meanwhile rocketry had made its beginning at the Institute. Actual rockets of a wide variety from simple jet-assist-take-off "bottles," up to bi-propellant powerplants of interceptor-craft type, are integrated into lab practice programs. Several years prior to the day we were shaken into awareness of space age possibilities by the first Sputnik, Northrop students had been designing, building and static test-firing rockets at a desert site equipped for tracking, telemetering and parachute recovery—a whole range of pre-space-age studies.

With man daily flashing past the sound barrier and launching probes into outer space, existing technologies grew more complex. New technologies hit such a rapid pace that several years constitute a whole generation in aviation. With these advancements, electronics assumed new importance in engineering education at the Institute.

The breadth of Northrop's program was further increased when liberal arts courses and humanities were added to the curricula, together with special advanced engineering subjects. With these additions, the Institute was authorized by the Superintendent of Public Instruction, California Department of Education, to confer the Bachelor of Science degree in Aeronautical Engineering, Aeronautical Engineering with Electronics Major and Aircraft Maintenance Engineering. Subsequently, the name "Northrop Aeronautical Institute" was changed to "Northrop Institute of Technology," which better expresses the program of the college. But while Northrop Institute had become a degree-granting college, the policy of providing a maximum amount of student-instructor contact in a minimum period of time has been retained. Since classes are in session 48 weeks of the year, the technical institute courses may still be completed in only two years. A Bachelor of Science degree, requiring the usual dozen of three month quarters, can be obtained in only three calendar years.

"From these applied courses," President McKinley observes, "has come a success story unique in the annals of engineering education and industry. Among the graduates are hundreds of men who now hold

(Continued on page 80)

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LEAVING things well enough alone has never been the trait of Ted Thomas of San Diego, Calif. Several years ago he built a Benson giro-glider with which he made a number of successful hops. But tethered flight soon lost its attraction, he wanted to fly independent of a tow line, reach higher altitudes and stay up longer. A powered giro seemed to be the answer and, again, a Benson design provided the solution. Thomas acquired a set of plans and built one incorporating his own ideas. Major modification consisted of installing the more powerful, 72-hp, McCullogh drone engine fitted with a propeller designed for Florida swamp buggies. Thomas has made a number of low altitude hops with the autogiro and it turned out to be everything he hoped for. Whenever time permits, he and Mrs. Thomas load it on their Austin-Healey sports roadster and drive out to the drag strip where he flies the craft. The giro is easily dismantled and fits neatly on a two-by-four frame bolted to the trunk, causing many a bewildered stare among passing motorists.

(Continued from page 79)

positions of responsibility in outstanding companies and organizations throughout the world. Robert Citron, who received his B.S. degree in Aeronautical Engineering from the Institute in the June '59 class, is a recent example. As the Moonwatch team at Northrop makes its sightings, 'Bob' is now adjusting his telescopes and cameras at Smithsonian's observatory in San Fernando, Spain. Three months before he graduated, Bob was flown to Cambridge by Smithsonian for an interview. They were highly impressed with his background and education so he is now a Senior Observer II for them—a position never before offered to a young man just out of college.

Citron is well on his way to a career in the space age. Writing to Professor Porter during his preliminary orientation by Smithsonian at Alamogordo, N. M., Bob wrote, "I am going through one of the greatest experiences in my life. Tomorrow is the last day of training and tomorrow night I fly to Cambridge for three days before leaving for Spain. The group here is just fantastic. There is a graduate Astronomer (Master's degree from Cornell), a graduate geophysicist from Ohio State, a Radio Astronomer from the University of California, two graduate Electronics Engineers from MIT and myself. I'm thrilled with my job. I would like once more to express my appreciation for all the help and inspiration you have given me."

Important to an observer seems the fact that most student activities at Northrop

are closely aligned to the curricula. Student branches of the Institute of the Aeronautical Sciences, the Institute of Radio Engineers and of the Society of Automotive Engineers, in addition to the Pacific Rocket Society and the Moonwatch team, already mentioned, are represented. The Institute branch of the SAE is the largest student unit in the society. In addition to other advantages, these organizations offer students the opportunity of preparing and presenting technical papers in competition with many other colleges in the state. They also make it possible for the student members to make valuable professional contacts while attending the institute. With the great demand for engineers, participation in one of the professional societies at Northrop often has resulted in a direct line of communication with some executive looking for new engineering talent.

June, 1959, graduate, Andy Oberta, for example, participated in the Moonwatch and rocket testing programs of the Pacific Rocket Society. He won numerous honors for his technical papers at student meetings of I.A.S. and S.A.E. The local manager of one of the professional societies was so impressed with Oberta that he wrote Aerojet in Sacramento suggesting an interview. Andy chose to accept Aerojet's offer from among others he had received, and is now a designer on one of the best known Navy missile projects vital to our present front line defense.

The list of far-famed firms employing Northrop graduates looks like a full air and space age roster. "Most every project for new aircraft, missiles, satellites and space vehicles that we know of," observed President McKinley, "has Northrop Institute graduates on its engineering team.

"Many times a company has offered to hire an entire graduating class. But since each senior is usually offered six or eight excellent bids, each individual graduate accepts the position of his choice. We want our students to think and act for themselves."

Presumably every college "points with pride" to the success of its graduates and is at special pains to treasure the testimonials sent back to the college from those who feel that their school training proved a firm foundation for their success. It does seem to me, however, that Northrop Tech has more than its share of such testimonials. Lee Murphy, a B.S. degree graduate of last spring's class, is typical. Murphy, a research engineer with Autonetics, a division of North American, wrote back to the Institute . . . "Tell the students they can be proud of the electronics program there. I find that I know as much in my subject as graduates of the biggest colleges."

In everyone, from President McKinley to the most recently enrolled student, one senses a feeling of dedication. Behind the walls of the recently-constructed engineering building, in the chemistry and tool engineering laboratories and in the classrooms, the atmosphere is academic but with due emphasis on *practical application* of engineering principles. "Learning by doing" and "designing for producibility" continue to dominate Northrop's approach to an engineering education. END

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Julius Caesar

(Continued from page 31)

caprice of your man-made gadgets. I berate myself for indulging in moments of doubts.

An hour passes but the sea of milky cloud remains unbroken, merging all around into the brilliant blue of the sky. Finally we start tinkering with the radio compass. The northern reaches of Greenland are not far distant. The radio direction finder needle quivers, swings, then points directly over the nose. We're dead on track for the Nord beacon. The last trace of doubt fades away. Meanwhile our earphones have picked up a faraway voice. Soon there are more voices—radio chatter between big birds of a tanker formation which calls itself *Headburr*.

As we close the gap the voices strengthen and finally they're loud and clear. I recognize the voice of Colonel Tara who commands the tankers. They are from Tactical Air Command, Langley AFB, and are northeastbound, crossing the ice cap from the direction of Thule.

The tankers are approaching the beacon at Nord where we will rendezvous. There appears to be only one snag. Our friends from Virginia are flying formation on instruments in the clouds. "That's great," chimes in Al Kucher through the intercom, neatly pinpointing our collective reaction. We'd all appreciate a little visibility for the hook-up; not too much, necessarily, but some.

We go on the air and carry on a brisk conversation with the distant refuelers. They are climbing in an attempt to top the clouds but, from where we sit at 35,000 feet, the tops below us look pretty high. Finally a voice reassures us they're between cloud layers to the north of Nord, with intermittent visibility.

We've crossed the 80th parallel of north latitude and have now become pips in their radar. Al Kucher flexes his muscles and uncages his eyeballs, making ready for his joust with the drogue. The tankers track due north toward the Pole along the 18th meridian of west longitude. In hot pursuit we're vectored in from astern. We pass over the Nord radio beacon precisely on flight plan, boring down through the milky murk in close formation for the hook-up.

Momentarily coming into the clear at 24,000 between layers of thin stratus, we tally-ho the four tankers, then lose sight of them intermittently as they play hide and seek in the wispy clouds. Coming up from behind we finally get a steady bead on our targets as we draw in close. Our probes slam home on the first pass. My troops are real pros.

We hang on and get fat, occasionally losing sight of the rest of the formation in the formless layers of broken cloud. In a few minutes, when satiated, we drop back to disconnect from the streaming hoses. The latitude now reads 83 north, less than 500 miles from the Pole. We'll stick with our big brothers for more than an hour, then get our last drink of fuel at the top of the world before striking out down the meridian toward Fairbanks. This is our alternative plan—to stay with

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the tankers if the weather so dictates. Today it would be imprudent to do otherwise. The visibility tends to worsen as we fly north.

The other plan was to whisk our way to the Pole at jet speed, then orbit in wait for the tankers, theoretically circling the earth with each orbit.

With an eye to the weather we'll let well enough alone. There'll be no such frolicking today. The tankers' auxiliary jet engines boost those ancient propeller airplanes along at pretty fair speed, but our fuel glutted birds find the pace a little sluggish. Their droop snoots rear up at a high angle to maintain the awkward gait.

Now if those were KC-135 tankers it would be a different story. There would have been no problem with clouds today, and we could have snuggled up in formation with a tanker mother ship at jet speeds to fly comfortably for thousands of miles together. A single jet tanker could have met us over England, kissed us good-bye at the Pole, then flown thousands of miles to tend other business.

We're not complaining. Our refuelers today have given us magnificent support. But those TAC tanker men up ahead wouldn't be grief-stricken if they got new tools in the form of jet tankers.

Our playmates maintain judicious separation from one another as we gambol through the mists. Eventually the higher clouds break away and disappear altogether, exposing far below an unbroken cloud deck that totally enshrouds the Arctic ice.

Our computers count away the miles as we slip on past 86-87-88-89 degrees of north latitude. The sun hangs low over the left wing, inviting a reading with the sextant that shows we've strayed a few miles left of our chosen meridian. Tankers and fighters turn a few degrees right to pin down the magic spot that marks the top of the earth's axis.

It's time to get back on the hose for that last drink—the one for the road, so to speak. We go to work on a pair of fresh tankers, but this time *Excalibur's* probe nudges the edge of the drogue's conical receptacle, pushing it aside toward the cockpit canopy and causing the heavy drogue to graze the top within inches of my helmet. As we move further forward the heavy black hose slithers like a snake along the top of our fragile cage.

"That's great," says Al Kucher, as he pulls away. We back off to try again and are soon hooked up. In the meantime Bob Titus tells us his *Pole Cat* is guzzling away.

But the obstreperous drogue we've latched onto turns out to be a dud. The stingy black hose refuses to yield a single drop. The fuel gauge stares dolefully at my anxious visage.

A hollow voice from the tanker says, "*Caesar* lead, we've got no pressure."

Suddenly there's a new malfunction as the unruly hose starts a crack-the-whip motion. The long slender probe that juts from *Excalibur's* right wing bends crazily up and down with the violently whipping drogue. I entertain visions of the probe

(Continued on page 84)

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(Continued from page 83)

being ripped out by the roots to open a gaping hole in the fuel system.

"That's great," Kucher sums up the situation again as he pulls back and disentangles.

We've seen enough of this black, coiling monster and move over to stab another drogue behind the tanker's right wing. The fuel gauge needle climbs. We're back in business. Hanging on like hungry little pigs we cross the top of the world and head south. I hear a few chortles on the radio. Moments later the fuel gauges hit the peg. We say thanks and pull away.

A minute ago it was the evening of August 7. Now's the morning of the same day. We climb to 30,000 feet and start boring a hole down the 147th meridian. Some recollections come to mind.

I've come this way before—way back in 1951. It was a single engine machine that time, too—an F-51 Mustang fighter called *Excalibur III*. The name has been lucky so I've hung onto it. There was only one seat in *Excalibur III* and no wing man. The Arctic seemed like a different place when flying alone, perhaps a little more formidable than now; probably because there've been a lot of multi-engine trespassers de-sanctifying the far north in more recent years. Then, too, it's not such a lonely ride today. *Pole Cat* is close at hand and Al Kucher is on the other end of the intercom.

But there's another significant difference. The fighter airplane has ripened with the years, sporting gadgetry and electronic black boxes which let it do things a little airplane couldn't tackle before. It has grown out of its short pants—able to do strategic jobs if called upon, or to stomp out the brushfires.

Pressing south toward Alaska the sun is still our guidepost, now bearing slightly left of our collective noses. My sun compass wobbles on its unsteady mount so that the reading is not altogether precise, but there's no real problem. By an odd coincidence of flight plan timing we could—if lost—fly directly toward the sun during the scheduled three-hour run from the Pole to Fairbanks, and still arrive in Eielson's vicinity, albeit in a somewhat curved path.

To make a good radio landfall on the Alaskan coast it's not a bad idea today to err slightly to the right of our chosen meridian. Fudging the wobble of my sun compass I apply body English to the right.

On the other side of the world between Greenland and the Pole we picked up a bonanza of six minutes on the clock, putting us that much ahead of schedule when we said farewell to the tankers. With that kind of cushion it should be a cinch to breeze into Eielson on schedule. From 90 degrees north latitude to Eielson Air Force Base it's "downhill" across some 1,400 miles of ice plus a few hundred of Alaskan mountains. But the complexities of the flight are behind us. Now it's mostly up to the engine. Still it's a little early to be counting the flight plan chickens. It takes only a look over the side at the sprawling sea of broken ice to jar a fellow's complacency. But there's no use stewing.

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planes adds a measure of aplomb to the proceedings. Seven weeks ago we flew them across the middle Atlantic from Langley, Virginia, to England and Italy, via the Azores. We've got a lot of ocean under our belt.

Our computers click off the miles by the hundreds but the vast panorama of ice seems to go on forever.

At 80 degrees north latitude we're scheduled to pick up a tailwind, but the radar feelers of our Doppler bounce back from the ocean ice to tell us a very different story. The tailwind fails to blow. We must flog our horses or arrive late over Eielson, a blot on the navigational escutcheon.

The flight time analysis crystal-balled by Lieutenant Wooddy before departing England added up to 9:30.5 hours—overhead Eielson at 2324 Greenwich, early afternoon in Alaska. A week ago at the Pentagon the flight plan was billed at 9:27 hours—winds and weather sight unseen. We'll only slip a small cog on that one. At any rate we'll arrive in Alaska before we left England. The change in time at the Pole fixed that.

Pressing on toward the 75th parallel our earphones pick up a faraway voice, "*Julius Caesar* from *Duckbutt*."

Duckbutt is our air-sea rescue support plane patrolling 200 miles north of Alaska. "Welcome back to the cock-eyed world," the faraway voice seems to say.

As we close the miles, *Duckbutt's* radar spots us west of course, on track for landfall at Oligtuk. A new voice joins the conversation. It's Barter Island on the DEW line.

The coastline flashes underneath at 2245 and Bob Titus says, "The Arctic is a piece of cake."

That's what we always say . . . . when the ocean is behind us!

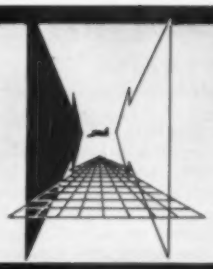
With 400 miles to go we shovel on a little more coal, pouring contrails across the cloudless Alaskan sky. The mountains of the Brooks range slide behind. Winter changes to summer as every feature of the Alaskan landscape becomes a delight to eyes that have been starving on a diet of Arctic waste. It wouldn't be much trouble to push through to Japan, less than seven hours away. All that's needed is a single jet tanker to drop us off at the far end of the Aleutians.

What else did we learn?

It appears that the small, inexpensive, unsophisticated computer won the day. Perhaps that's a victory for taxpayers and pilots as well.

At 35,000 feet over the winding Yukon we've got the end of the line in sight. Eielson is over the nose. But there's trouble ahead. The airstrip has been infiltrated by a big bull moose who stands astride our runway. The air police are arguing with him.

We lose seven miles of altitude in a hurry and scream across the base with the airspeed on the peg. The minute hand of the clock reads 24, just like that crystal ball told us, back in England. And the sonic boom won the argument for the Air Police. The Moose gave up and high-tailed out across the tundra, leaving the runway to *Julius Caesar*. END



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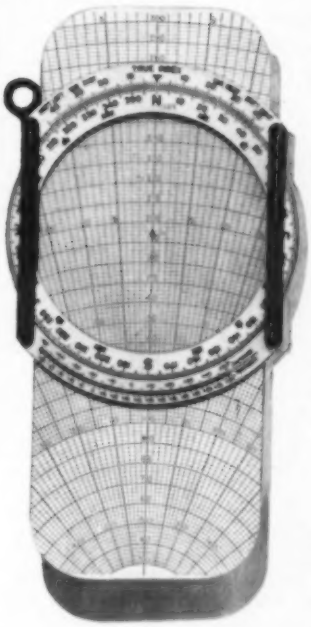

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I'm Still Learning About Flying

(Continued from page 47)

very stupid pilot to get lost.

Well, I'm here to say that I've got what it takes.

With two radios that will point to the stations and tell you what compass heading to fly, getting lost isn't easy. Yet I managed it with scarcely any help from co-pilot Frontiere on the State Fair tour.

Through overcast skies and frequent rain squalls I was flying from Cincinnati, Ohio, to Charleston, W. Va. When we were about 50 miles from Charleston the ceiling came down to 1,200 feet, forcing me to fly over the Monongahela River. The clouds were resting on the mountain tops and I was flying below them where static from the thunderstorm made it impossible to hear on the low frequency. Being that low, naturally my omnigator and simplexer wouldn't work either.

In logging the details Dominic wrote: "To make matters worse, all four omnis in a 150-mile radius were either not working or their frequencies had been changed and did not show on our WAC chart or our Jeppesen notices. We were without radio assistance and the compass was flipping its needle from the magnetic disturbance in the mountains. During all this the weather reports were saying 2,000 broken 4,000 ceiling, but we never caught up with the weather they were describing."

The airport being closed because of the thunderstorm, I had to turn back when we were only ten miles from Charleston. I flew north, hoping to land at another airport indicated on my map.

As Dominic later put it rather plaintively, "With a meager half-hour's fuel left, we flew to the mapped alternate airport. All the landmarks checked . . . two rivers joining a dam . . . stacks . . . a town. But no airport on the ground. For the first time I realized the full meaning of that phrase: 'The map is not the territory.'"

I wish there was a technical term I could use to cover the embarrassing truth about what happened next, but the fact is we were just plain lost.

When we finally convinced ourselves that the airport we were looking for existed only on the map and not in the territory, I continued north for Gillespie and ran into another thunderstorm that forced me to do a 180. I followed the southwest fork of the river, which bore a confusing resemblance to most any other fork of most any other river. But in spite of everything, I made my way at last to Huntington where we stayed on the ground an hour and a half. After that, I flew right through to Lewisburg, W. Va., in time for my evening performance at the State Fair.

The squeeze was over, but the experience taught both Dominic and me an important lesson. All the next day we flew with our radios turned off so we could brush up on using map, ruler and pencil. We also made up our minds to complete our instrument training.

Addressing himself specifically to flying business and professional men with schedules to meet, Dominic says, "Take heed. Get an instrument ticket. Your life may depend on your knowledge."

Unlike last summer's tight pinch, which was due to my own pilot error, my first and only other aerial crisis involved a mechanic's mistake. I'd like to preface the incident by saying that while making one of my frequent cross-country flights on a commercial airline some years ago, I was talking to a pilot who said his work was pretty routine, except when troubles started piling up.

At that time I didn't quite know what he meant by "troubles piling up."

I've learned.

Three or four years ago I had a mechanic install some instrument flying equipment on my Navion. Anxious to try it out, I left Los Angeles and headed for Las Vegas half an hour before sundown. By the time I got to Daggett, it was dark.

I turned on my instrument lights, only to discover I didn't have any. In installing the radio equipment, the mechanic had cut the wires of the instrument panel lighting.

It was a dark night and I was flying in mountainous country through an overcast sky. No stars. No moon. But I said to myself, "There's no need to panic."

Confidently, I turned on the dome light. It burned out in a moment. Again I said to myself, "There's no need to panic."

Priding myself on being such a well organized pilot, I reached for my flashlight and switched it on. Half a minute later its light turned yellow and faded out on me.

"Now," I conceded with desperate resignation, "this is a good time to panic."

Everything was black, but just then I glanced off to the right and saw a cluster of small lights some 20 or 30 miles away. Now at least I could tell from them which way was down!

The lights turned out to be cars on a highway which I prudently followed into Needles, where I landed.

Looking back over my airborne experiences, I'd say I've had 20 years of safe flying. Safe—but eventful.

Looking forward, I'd like to say this: I'm eager to take on the next 20. END

Bellanca 260

(Continued from page 37)

flight. It flies well at 200 mph, 160, 140, 120 or 80 mph. To carry this to somewhat of an extreme, I kept coming back on the power while rolling in trim to see how slowly I could fly the Bellanca in a "clean" configuration (gear and flaps up) and yet have positive control.

By the time I trimmed the nose to an uncomfortably high angle, the airspeed was down to 65 mph. At this airspeed I made double needle-width turns without the aircraft falling off. Aileron and rudder were effective throughout the turns.

In checking the Bellanca for its stall characteristics, I found that it breaks at about 48 mph—as close as I could read the airspeed—and the stalls are gentle with aileron response throughout the cycle.

Another feature which impressed me is the go-around response. With flaps and gear down, and airspeed down to 60 mph,

we simulated a go-around situation. Power was added and the Bellanca started upward, accelerating steadily as I trimmed the nose down and retracted the gear. When I retracted the flaps, there was no sink and the acceleration was quite pronounced.

Other air checks included horizontal and longitudinal stability tests. Longitudinally, the Bellanca recovered in two oscillations, when the nose was pulled up to lose about 20 per cent of its forward speed and then the control wheel was let go. Power and trim were set for cruise.

During the horizontal stability check, the plane held a point on the horizon for some time without any aid from the pilot. With power off and nose high trim rolled in, gear and flap down, it will let down at 70 mph at a rate of descent around 1,000 fpm—the pilot can sit there with hands and feet off the controls.

On the way back to the field, the thought occurred to me to check the power-off glide in a simulated forced landing due to engine failure. With gear and flaps up and power off, the best glide was found at 90 mph. In a glide at this airspeed, the rate of descent was a scant 400 fpm. Though I suspect that a frozen propeller might decrease the glide performance some, I feel that overall, from an altitude of several thousand feet, the pilot would have a good chance of picking the best field in the immediate area for an emergency landing.

To land the Bellanca 260 under normal conditions, is no trick at all. Power is reduced on the downwind leg and when the airspeed is less than 168 mph, the gear can be lowered. Speed is further reduced on the base leg, and when on the approach the flaps can be lowered at 90 mph or less. I made the approach at 80 mph and then slowed to 70 mph over the fence. The airplane settled down on the first one-third of the runway.

I found the Bellanca 260 an enjoyable airplane to fly. Its wide speed range, gentle flight characteristics and excellent take-off and climb performance, offers the business pilot an aircraft which can get in and out of most any field, and carry him to his destination at 200 mph. END

BELLANCA 260 SPECIFICATIONS

Span	34 ft. 2 in.
Length	22 ft. 11 in.
Height	6 ft. 4 in.
Weight empty	1,700 lbs.
Gross weight	2,800 lbs.
Maximum speed	215 mph.
Cruising speed, 75% power	204 mph.
Range, (standard tanks)	455 mi. approx.
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Weather

(Continued from page 38)

At McGuire AFB, the Dage console, with its camera, controls and monitor screen, is located in the weather shack of Detachment 22, 9th Weather Group. Five times a day, scheduled briefings are given via television by the Weather Officer on duty. And each time, receivers at five separate points on the base bring these broadcasts to flight crews, commanders, and anyone else who's interested. It has been so successful that 13 additional "drops" (receivers) have been requested for other strategic locations at McGuire.

The weather picture is drawn on a map, and flashed on the screen, where the forecaster points out movement of fronts, wind conditions and what-have-you. With a flick of the switch, the scope of the CPS-9 weather radar can also be flashed on the screen, and the forecaster can brief you on the local weather directly from a radar picture of cloud formations around the base. A new development that's in the works will enable the CPS-9 scope to be shown on just a corner of the screen, while the regular weather-map transparency takes up the rest of it.

There seems little doubt that, aside from its military usefulness, Weathervision has potentialities for civil aviation —particularly in high-density areas like New York, Miami, Chicago, etc. Using micro-wave transmission (instead of the land-lines in use on the Air Force bases), airfields within a given radius of a centrally-located weather station could be hooked into a civil Weathervision system. At regularly scheduled intervals, televised weather briefings for the area could be shown. There's little need to point out how valuable it would be to private and corporate pilots to have a *visual* picture of the local weather and how it's shaping up, rather than just a verbal analysis.

The FAA has expressed interest in the system and is said to be studying its possible applications for general aviation. The airlines, too, might find such a system handy where they have more than one major airport to service simultaneously, as they do in New York and Chicago.

Although no civilian application of Weathervision has been made so far, the system seems like a natural. END

Sky Harbor

(Continued from page 45)

student pilots, charter services, crop dusters, and the Air National Guard.

With its importance as an industrial and trading center serving a vast region, Phoenix has become one of the busiest cities for business flying activity in the southwest. And business flying looms large in the new master plan for Sky Harbor.

More than 350 aircraft, owned and operated by all segments of aviation, are housed at Sky Harbor and approximately 35 companies, large and small, hangar their aircraft there and use it as a base for regional and national operations.

These operators of aircraft and heli-

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One interesting business aircraft operator is Blakely Oil Company, which has 30 or more retail service stations throughout Arizona and owns two Bell helicopters and an Aero Commander. The helicopters are used for short-haul transportation in the Phoenix area, for company publicity events, for forest fire and rescue work. They also are leased by real estate companies to give prospective buyers a different look at property.

Another is Goldwater's, Inc., operator of several department stores. The pilots are Senator Barry Goldwater and his brother Bob, who use a Twin Bonanza in business and, when necessary, in politics.

Two companies based at Sky Harbor employ women as pilots. One is Mrs. Ruth Reinhold, who flies a Bonanza for Neil McGinnis Equipment Company, distributor of heavy farm and road maintenance equipment. She is one of the oldest women pilots in the world. The other is Mrs. Juanita Newell, pilot of a Cessna 310 owned by J. H. Welsh & Son, plumbing contractors in Arizona, Nevada and California.

The airport annually handles thousands of other aircraft bringing business men into the area, and a large volume of local and itinerant aircraft flown for pleasure. The airport has another type of user who is typically western—the woman who flies into Phoenix to shop from a town or ranch 50 miles or more away, and the farmer who shuttles to town by air rather than by car. The only aircraft without radio permitted on Sky Harbor are those owned by crop dusters based there and they land for servicing only after making arrangements with the tower by telephone.

The importance of business flying and other segments of general aviation to Sky Harbor is demonstrated by the amount of gas they demand (none is sold to airlines). Five years ago, gas sales averaged about 50,000 gallons a month. The average is now at 160,000 gallons and the curve is climbing. Another indication of general aviation activity at the airport is shown in figures covering the number of transient aircraft registered. They land at the rate of 1,200 to 1,300 a month and there is a steady increase of about 25 percent each year in transient business.

Business and pleasure flying, both local and itinerant, helped to make it possible for Sky Harbor to be ranked fourth in the nation in total traffic movements in the 1957-1958 fiscal year, according to the FAA. Only Chicago, Miami and Los Angeles handled more traffic movements in that period. With 310,400 traffic movements (two-thirds of which were recorded by general aviation), Sky Harbor outranked such busy cities as Dallas, New

(Continued on page 90)

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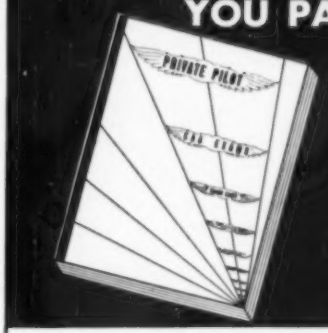

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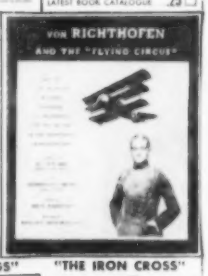

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(Continued from page 89)

York and Washington. The rate of air traffic movements is increasing steadily at Sky Harbor, providing greater impetus for accelerating the new master plan.

The new master plan for Sky Harbor, prepared by James C. Buckley, Inc., New York transportation consultants, and Lescher & Mahoney and Weaver & Drover, Phoenix architects, can be divided into two parts. One covers scheduled airline operations and the other deals with general aviation.

With both American and TWA starting jet operations into Sky Harbor by autumn or winter, the most urgent need and step number one in the master plan was determined to be extension of the south parallel east-west runway from 7,800 to 10,000 feet. After its completion, the schedule placed construction of a new terminal building, additional auto parking and airline gate positions. When peak hour capacity is reached on the south parallel runway, the 6,000-foot north parallel also will be extended to 10,000 feet. Ultimately, both east-west runways will be extended to 12,000 feet. The present northeast-southwest will be abolished. A diagonal runway is not needed at Sky Harbor, because the wind at Phoenix is steadily from the east in the morning and from the west in the afternoon and evening.

General aviation facilities, concentrated in the northwest section of the airport will undergo a marked transformation in the next five years or so, under the master plan, and it is anticipated that expenditures in that period will exceed $1.5 million.

The first step in a program of transferring general aviation activity from the north to the south side of the northwest section has already been taken, with the construction of eight new T-hangars. Sixteen more also are planned. During the next five years, according to current plans, four large new hangars (each will cost about $400,000) will go up in the general aviation area to house fixed base operations and to provide aircraft storage space and display showrooms.

An interesting phase of the latter program is the plan to reduce the number of fixed base operators from the present 14 to no more than six. William J. Ralston, superintendent of airports, believes that half a dozen can do a superior job and that less competition will mean better earnings for each. Surprisingly, the plan has developed little opposition and there already is talk of mergers among the operators.

As originally drafted, the master plan (it is changed almost daily) recommended that the north side of the northwest section be devoted to industrial development after the general aviation facilities (repair shops, flight schools, charter and rental services, aircraft sales agencies, crop dusters, storage hangars) are moved to new quarters across the area. However, with business flying booming and accounting for the largest percentage of Sky Harbor's air traffic movements, it is now believed that the north side land should be reserved to help take care of that segment of aviation's growth. And in that connection, there is a possibility that pri-

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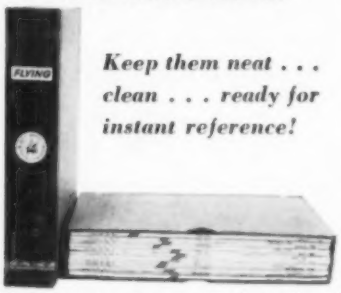

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vate and instructional flying may one day be assigned to a Phoenix satellite airport.

Sky Harbor has been on a self-sustaining basis for five years or more and every improvement under the new master plan must be financed from airport revenues. The initial phase of the program will be financed by proceeds of a $4.2 million airport revenue bond issue sold in November, 1958. It will cover the new $3 million terminal building, for which $500,000 in federal aid has been allocated, and aircraft loading positions. Ground for the building will be broken next March. About $900,000 in federal aid will be available in each of the next two fiscal years for work on runway extensions and ramps. A bond issue to cover financing of the first part of the new construction in the general aviation area will be offered in 1959 in an amount still to be determined.

The net result is that a sound basis has been laid for the financing of needed expansion with airport revenue bonds. Everyone connected with the operation is confident that airport revenues will continue to be sufficient to secure all future bond issues needed to pay for Sky Harbor improvements up to 1985 and beyond.

Through sound long-range planning, which recognizes orderly stage-by-stage development rather than a series of crash programs, Phoenix appears to have found the solution to the problem of keeping capacity of its air traffic center reasonably ahead of demand. END

The Autogiro

(Continued from page 35)

itself. In every respect the new machines were much better than the models sold in the early 1930s, but by the time they were developed, the Second World War was imminent and conditions were not promising for their introduction.

Since then the helicopter has attained its present stage of development, and this is a new factor that must be considered in appraising the wisdom of reviving the autogiro now. Thus a comparison of the capabilities of the two versions of rotary wing aircraft is in order.

The helicopter has its power applied through the rotor, and therefore is capable of continued vertical climb and of flight at zero speed without loss of altitude, a performance beyond the autogiro's capability. All other flight performances, including take-off, and landing without forward roll, are shared by both the autogiro and the helicopter.

The autogiro's power is delivered through a propeller, a more efficient thrust producer than a rotor, making it faster than a helicopter of the same power. With a lower initial cost and less structural weight in its hub and rotor-drive mechanisms, the autogiro carries more payload at lower unit operating costs. This advantage holds for all operating speeds above 25 to 30 mph. It is a safer aircraft to fly, with lower sinking speeds and a much flatter gliding angle in power-off flight.

From the above we may conclude that the airplane is the most efficient aircraft, measured by the load-speed-power for-

(Continued on page 92)

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(Continued from page 91)

mula, if operated over reasonable distances from relatively large airports. The autogiro is the most efficient aircraft for short distances, operating from areas too small for the airplane. The helicopter takes over for missions which require hovering flight or continued operations at speeds below 20 to 25 mph.

The best speed for crop dusting, around 30 to 50 mph, puts this type of flying in the range of the autogiro's greater efficiency. There are many other kinds of flying where the autogiro has advantages, including a large part of business flying, a still larger part of private flying, and almost all transport for distances of less than 150 miles.

The transportation of passengers and goods over short routes is the least developed part of aviation, because there has been no aircraft available to do the job. The revival of the autogiro may supply the missing ingredient needed to penetrate this short-haul market. END

I Learned About Flying

(Continued from page 56)

wasn't a clearing. Sure enough, it looked like blue sky. San Francisco called and I told them that I had broken out at 8,800 feet. They wanted to know whether I was over land or water. In a minute or two I notified them that I was over land, near a canal and a highway and was told that I might be south of Tracy. A turn to the left assured me that I was south of Tracy and I radioed this information to San Francisco. They told me to radio them upon landing at Tracy. Since I was behind the hills I could not reach San Francisco so called Modesto Radio and had them notify San Francisco Radar that I was on the ground. I landed at Tracy at 1715 hours, about one hour after passing over the airport and had been in the soup about 45 minutes. I landed with approximately 15 minutes of fuel remaining.

I called Stockton by telephone to check the weather in the Bay Area to see if it would be possible to fly into San Jose. The weather in the Bay Area was supposed to clear at 1530 hours and remain clear until 2300 hours. My passengers felt that they had flown enough for one day, so I put a call into San Jose to have a car come and pick them up. As the Bay Area was clearing, I decided to fly the ship home. The people at the airport said they would wait about 20 minutes for me.

Taking off alone at 1545 hours, I was at an altitude of 2,000 feet in five minutes. From this point I was able to see San Francisco so I continued on over Livermore and Mission San Jose to the San Jose Municipal Airport, landing at 1615 hours. The round trip to Sacramento had taken four hours. It usually took me an hour and a half. I tied the ship down and went home to try and recover from a grueling afternoon.

From now on I'll top my tanks whenever and wherever I land, even on short runs and double check weather, especially when flying mountainous terrain. END

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Aeronca Chief

(Continued from page 48)

but apparently it did not work well for many pilots have had it removed. To "prop" the airplane manually calls for the aid of another person. Brakes are applied, carburetor heat control is pushed to "off", throttle is cracked, and the engine is primed if cold, once the fuel valve for the main tank is turned "on". Ignition switch is kept in the "off" position.

Out in front the other person pulls the prop through several times and then checks the holding of the brakes by pulling forward on the propeller hub. Satisfied that they are locking the wheels (if not, chocks should be used to block them), he calls for "switch on" and then snaps the prop through. Usually the engine catches on quickly.

Sometimes when the Continental in the Chief is very hot after a flight and is to be started again soon after stopping, it will not catch on with the throttle normally cracked. It has been found that under such conditions it is necesssary to open the throttle halfway. Be sure to have the wheels chocked, control wheel held well back, and come back on the throttle as soon as the engine begins to fire and take hold. Make sure that the person swinging the prop is aware of the throttle setting and alert to clear the prop as soon as he snaps it through.

Visibility from within the cabin of the Chief is rather good when taxiing. The nose cowl is relatively flat and allows a view of the ground some four to five yards in front of the airplane. The craft handles easily and rides smoothly on its fixed landing gear equipped with oil type shock absorption.

Prior to take-off, mags are checked at 1,500 rpm (max drop about 100 rpm); the carburetor heat is also checked at the same rpm and there should be a noticeable drop; trim is set for neutral; and with the control wheel held back, a static rpm check can be made. What the static rpm will be depends upon the pitch of the propeller. Normally the range is between 1,950 and 2,100 rpm.

On the take-off run, the Aeronca Chief steers well with light pressure on the rudder pedals. With wide-open throttle the craft accelerates at a good rate, and if the control wheel is held in neutral, the airplane streamlines itself and begins to get light between 45 to 50 mph. At 50 mph and above, the Chief becomes airborne with adequate lift and I did not experience any sink at the lower flying speeds.

In the climb with full throttle, at a gross weight of 1,250 pounds, the pilot can expect a moderate rate of ascent which checks out close to 500 fpm during the first minute. Take-off distance is about 700 feet under standard conditions.

At altitudes up to 8,000 feet, I found that the Chief performs well considering its small powerplant and fixed-pitch wooden propeller. It trims up nicely and, if rigged properly, will fly hands off. It can be flown equally as well with rudder or wheel only, maintaining straight and level flight in cruise. I noticed in several

(Continued on page 94)

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(Continued from page 93)

Chiefs that, in order to get on the step when in cruise, the trim should be set for a slight nose-down condition, and back pressure applied manually to the control wheel to effect the proper angle of attack of the wings.

In medium and steep turns only moderate control pressures are required. Control is good over the speed range. When slow flying at 50 mph I noticed a softness in the control; at 60 mph there was good positive control. With power off the Aeronca Chief begins to fall through at 40 mph. The stall is preceded by a slight buffeting and then the nose begins to lower at a rate near 300 fpm.

With cruise power on and the nose pulled up to an uncomfortable angle, the Chief will hang on until it reaches the 40 mph mark and then will begin to stall. Release of the back pressure at this time will allow the Chief to catch itself and fly out of the stall.

The lightplane has good horizontal stability at cruise power. I pulled up the nose until 20 per cent of its forward speed was lost (about 68 mph indicated) and then released back pressure. The nose lowered itself and on the down cycle of the oscillation the airspeed read 100 mph. Recovering on its own, the nose came up and the airspeed read 75 mph when upper portion of oscillation was reached. After approximately two oscillations the plane was back in level flight, indicating a normal cruise speed of 85 mph. In three tests the highest speed attained in the down side of the oscillations never exceeded 100 mph. The Chief is redlined at 128 mph.

Landing the Aeronca Chief on its "no bounce" gear is an easy matter. Cruise power is maintained on the downwind leg. Carburetor heat applied as power is reduced or the throttle closed, depending upon wind conditions. On base leg a glide of 65 mph is set up and held throughout the approach until "over the fence." The airspeed is then reduced to 55 mph and held until the flareout.

If the airplane is dropped in from a foot or two, the impact is absorbed by the oil landing strut and there is no "back wave" of energy. The airplane sticks to the runway and continues its landing roll in a proper and dignified manner.

Construction-wise, the Aeronca Chief is similar to the Champ. The fuselage, tail surfaces, wings, and ailerons are fabric covered. The wings have metal leading edges and are connected to the fuselage by double struts. The tail section is wire braced externally. Wheel brakes are of the mechanical type.

Maintenance-wise, most Chief owners report that costs are rather small if you keep the fabric clean and hangar the airplane. Given normal care, the Continental 65-hp engine will run some 300 to 500 hours before it needs a topping, and some 700 to 1,000 before it is due for a major overhaul. END

Effective 29 December, 1959, an amendment of CAR Part 43 prohibits a student from piloting any plane other than the "make and model" for which he is cleared by his flight instructor.

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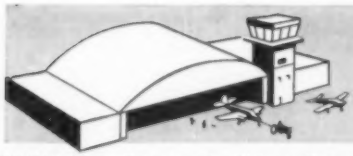

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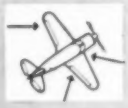

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1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Ziff-Davis Publishing Co., 434 So. Wabash Ave., Chicago 5, Ill.; Editor, Robert H. Wood, 1 Park Ave., New York 16, N. Y.; Managing Editor, Cecil Hamilton, 1 Park Ave., New York 16, N. Y.; Business Manager, Leonard O'Donnell, 1 Park Ave., New York 16, N. Y.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

J. L. O'DONNELL, Business Manager.

Sworn to and subscribed before me this 17th day of September, 1959.

[SEAL] WILLIAM PROEHMER, Notary Public.

(My commission expires March 30, 1960)

FLYING
JANUARY 1960
Advertisers Index

ADVERTISER	PAGE NO.
A C Aircraft Spark Plugs	2nd Cover
ASL	87
Academy of Aeronautics	70
Acme School of Aeronautics	89
Adams Aircraft Sales, Inc., Jack	92
Aero Design & Engineering Co.	3rd Cover
Aero Developments	82
Aero-Progress, Inc.	86
Aircraft Radio Corporation	5
Air France	3
Airheart Products Inc.	72
Airline Operations Training, Inc.	84
Airport and Business Flying Directory	89
Airtex Products	83
Air Traffic Control	92
American Airlines	23
American Flyers Incorporated	81
Argyle Scooter Cub	74
Aviation Photo Exchange	66
Aviation Service Publishers	66
Aviation Training Enterprises	94
Basch Co., George	94
Bavac	82
California Airmotive Sales Corp.	70
Cessna Aircraft Company	18, 4th Cover
Collins Radio Company	14
Downer Aircraft Industries, Inc.	75
Electric Auto-Lite Company, The	70
Embry-Riddle Aeronautical Inst.	68, 69
Esso Standard Oil Company	57
Federal Ski and Engineering Corp., The	92
Flying Classified Information	74
Flying Direct Sales Dept.	90
Flying Equipment Sales Co.	94
Flying Subscriptions	93
Flynn, Dr. John T.	82
Gem Aircraft Inc.	85
Gonset	76
Graubart Aviation Inc.	88
Grumman Aircraft Engineering Corporation	16, 17
Gull Model Airplane Company	90
HiFi Review Jazz Reprints	88
Indiana Technical College	78
Jay's	82
Jeppesen & Co.	77
Jones Box Corp., Jesse	90
Kane Aero Equip't	60
King Radio Corp.	21
Lake Aircraft Corp.	7
McCauley Industrial Corporation	67
McConnell Airline School	66
McMillan Industrial Corporation	83
Manger Hotels	80
Merlite Industries	74
Meyers Aircraft Co.	81
Mustang Aircraft Co.	94
National Aeronautical Corp.	73
Newark Air Service	20
Northrop Institute of Technology	6, 66, 84
Nova-Tech, Incorporated	8
Pan American Navigation Service	64
Parks College	82
Phillips Petroleum Company	19
Piper Aircraft Corporation	62, 63
Rock Sound Club, The	82
Ross Aero Publishers	79
Ross School of Aviation	79
Scandinavian Rent-A-Plane Service A/S	93
Schweizer Aircraft Corp.	90
Scott Aviation Corporation	71
Shannon School of Aeronautics, Inc.	78
Silhouette Marine, Ltd.	91
Silvaire Aircraft Co.	59
Skycraft Design	84
Skyhopper Airplanes, Inc.	74
Socony Mobil Oil Company	11
Southwest Airmotive Co.	87
Spartan School of Aeronautics	61
Sperry Phoenix Company	12, 13
Stadvec Aviation	78
Stits Aircraft	66
Sunny South Aircraft Service, Inc.	9
Survival Equipment Company	94
Teterboro School of Aeronautics	74
Todd's	88
U.S. Naval Air Station	91
Vantage Press	84
Varsity Shop Specialties	93
Vest Aircraft Co.	93
Vest-Mattoon Ill. Co.	70
Weems System of Navigation, Inc.	85
Zahns Airport	78
Zenith Radio Corporation	65

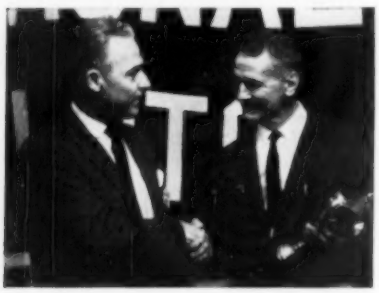
Briefings . . .

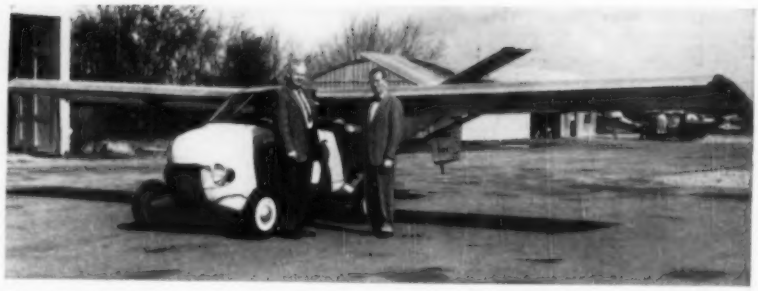
(Continued from page 15)

engine has failed and indicates instantaneously which feathering control is to be used. Safeather kits—depending on aircraft requirements—are priced from $450 to $900, less installation costs.

WRIGHT AIR DEVELOPMENT CENTER, Dayton, O., reports tests show that five-foot square markers with white numerals, placed 1,000 feet apart on a line 65 feet off the runway edge, and lighted with 75-watt lamps, furnish best marker system for assisting pilots in determining runway distances in take-offs and landings.

NATIONAL PILOTS ASSOCIATION has re-elected George Haddaway to serve another year as its president. Elected by the membership to serve with him are: Wm. Requarth, M.D., of Decatur, Ill., 1st v.p.; Elrey B. Jeppesen, Denver, Col., 2nd v.p.; Fred'k. B. Lee, former CAA Administrator, treasurer, and David H. Scott, Washington, D. C., secretary. Highlight of the annual meeting, held in Marshall, Ind., was the naming of Max Conrad (right) as "Pilot of the Year," and presentation by President Haddaway of NPA's silver trophy.





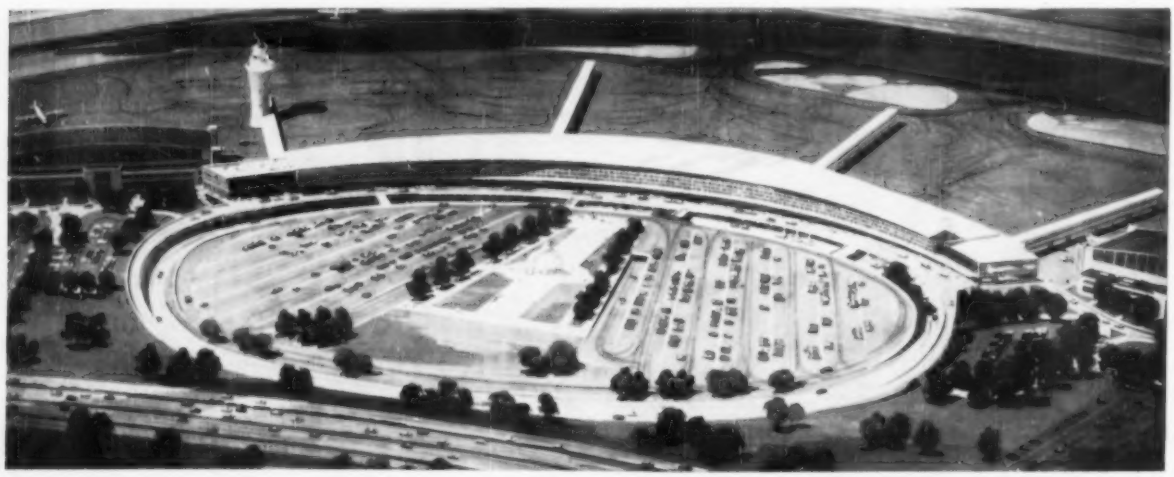
AT MARSHFIELD, MASS., Moulton B. Taylor (left), president of Aerocar, Inc., Longview, Wash., turned over the first of his company's FAA-approved Aerocars—combination airplane and automobile—to Thos. S. Weitbrecht, president of Marshfield Airways, Inc. (right). Dealer for Rhode Island, Massachusetts, New Hampshire and Vermont, Marshfield Airways is the first for Aerocar.

TWO AMERICAN pilots and a Soviet pilot have received FAI recognition for record flights established in 1959. USAF Capt. Geo. A. Edwards joined the world record-holders' roster for his speed mark of 816.277 mph over a 500-kilometer course, April 15, in a McDonnell RF-101C Voodoo. Renowned civil pilot, Max Conrad, entered aviation's Hall of Fame through his non-stop transatlantic flight of 7,668.507 miles in a single-engine Piper Comanche, June 2-4, from Casablanca Morocco to Los Angeles. Soviet Maj. V. S. Ilyushin captured a new world's altitude record of 94,648.792 ft. in a TU-431 single engine military jet, July 14 last.

IF PROPERLY APPROACHED, it is said, learning the Morse Code can be an enjoyable experience. On that assumption, Electra Records, 116 W. 14th St., New York, has recorded a 12-lesson course in code on a long playing record. By adjusting speeds up to 78 rpm lessons are progressively keyed to sending-receiving rates of from three words per minute to 16½ wpm. Five wpm are required by FCC for novice and technician licenses. Instruction book and record, $4.98.

WHEN AERO COMMANDER No. 800 rolled off the line at the company plant in Oklahoma City, and was delivered on Sept. 28 to James W. Cherf, v.p. of Cherf Brothers, Inc. and Sandkay Contractors, Inc., of Ephrata, Wash., the event coincided almost to the day with the delivery of the first Aero Commander just eight years before. To mark the occasion, George Pew (left), president of Aero Design, turned the keys of No. 800 over to Mr. Cherf (center) with Aero's v.p. for sales, Thos. J. Harris, at right.

UNDER A GRANT of $77,600 from the U.S. Public Health Service's National Inst. of Health, Flight Safety Foundation, Inc., has launched the first stage of a comprehensive survey of general aviation safety.



WITHOUT INTERRUPTION in service, New York's $56-million reconstruction of LaGuardia Airport goes on apace toward completion in 1962. Features include new three-story terminal five times the size of the existing structure; expanded gate positions; new 150-foot control tower, an entirely new runway, a two-level terminal roadway and parking area for 5,000 cars.

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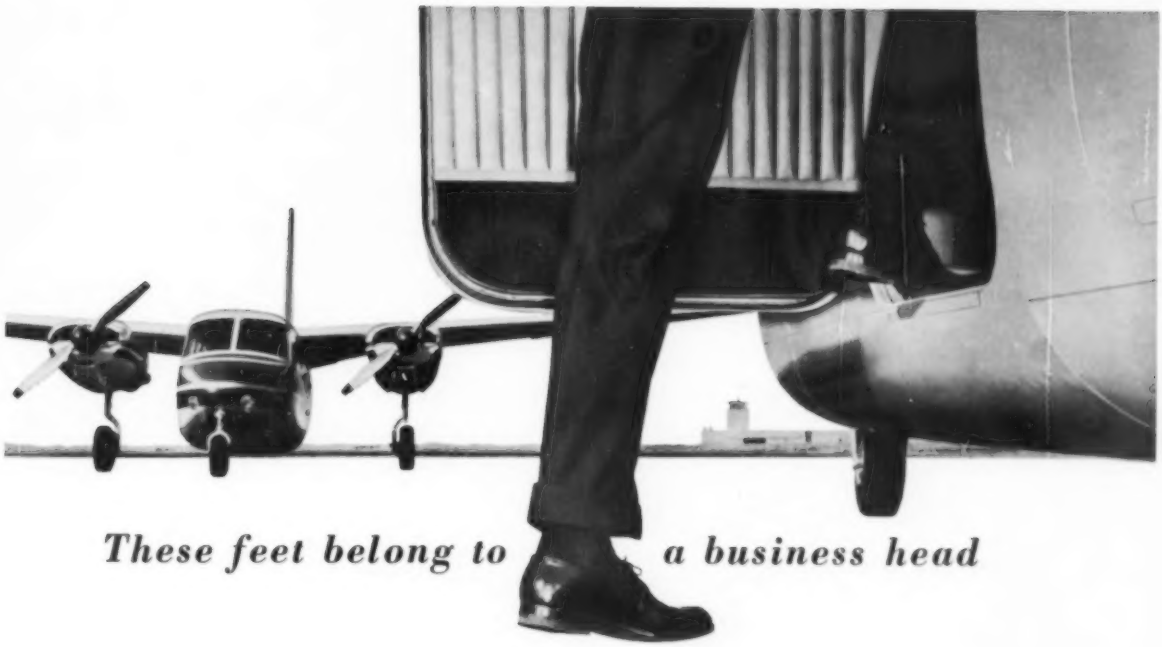

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